remotepro

remote supervision solutions

CAREL
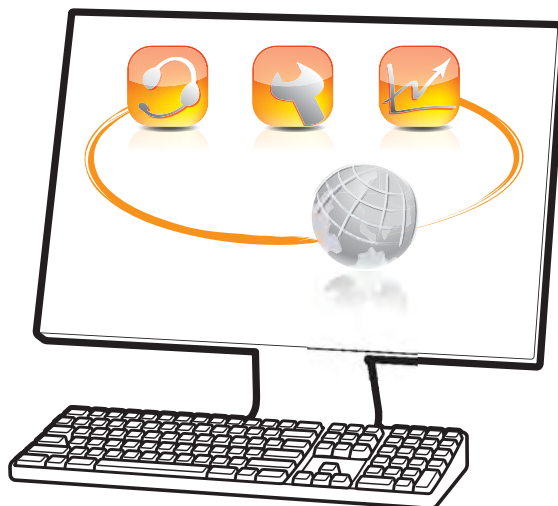
remotepro

(ITA) **User manual**

Integrated Control Solutions & Energy Savings

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Content

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1. INTRODUCTION

RemotePRO is a software for remote supervision of sites running Carel supervision systems (PlantVisorPRO, PlantWatchPRO, pCOWeb, boss). The software manages alarms, collects logged data and performs comparative analysis on site performance. By centralising all this information, a single interface can be used to troubleshoot any problems in site operation. Reports can be sent by email at set times, so as to transfer the information needed for a prompt response in the event of critical situations.

Other advantages include a complete overview of all the sites, improved maintenance, reduced operating costs and identification of actions to be taken as a priority to improve performance.

Personnel who can benefit from access to centralised data include:
*   site maintenance managers, who receive notifications and can plan service and repairs;
*   refrigeration specialists, who can monitor trend in cabinet temperature;
*   energy managers, who can compare energy consumption between sites and identify where optimisation is needed.

1.1   Main features

Overview:
*   user interface accessible via web
*   security guaranteed by the HTTPS protocol; differentiated access based on the type of "user" (administrator, installer, maintenance, user);
*   remote monitoring of the supervisors connected to the server, with life testing;
*   alarm management, with the possibility to acknowledge and inhibit alarms;
*   scheduled alarm notifications using rule engine;
*   alignment of data logged by local systems;
*   comparative analysis for evaluation of site performance;
*   alarm dashboards: reports and statistical analysis to support evaluation of site quality;
*   centralised document archive (for example, user manuals or maintenance diagrams).

1.2   Software modules

The system is based on scalable architecture, and the functions can be extended at any time. This allows the system to be updated while safeguarding the initial investment (by only adding the new modules that are needed).

Code	Description
RVSTDRM000	Remote maintainer
RVSTDDM000	Centralised data management
RVSTDRV000	Multi company management
RVSTDEN000	NRGDash

1.2.1   Remote maintainer

Basic module, required as part of the system, featuring:
*   user profiling and secure access to the system;
*   management of local supervisors, configuration of the remote connection and enabled functions;
*   list of connected sites, with the possibility to access the local supervisors;
*   life test to check supervisor operating status.
*   remote management of local users for centralised password settings (available only with PlantVisorPRO 2 and boss);
*   centralised alarm management, with the possibility to acknowledge alarms and check the status of individual systems;
*   alarm notification by email with scheduled rule engine;
*   alarm dashboards to identify the sites with most problems;
*   centralised document archive.

1.2.2   Centralised data management (*)

The module is used to align a subset of logged data acquired from the supervisors and save it in a centralised database. This database can then be used to:
*   access the data offline (without connecting to the local supervisor);
*   create Excel reports of data to export or send by email;
*   analyse temperature conformity;
*   generate easy-to-read HACCP reports.

*Module RVSTDRM000 "Remote maintainer" is a pre-requisite

1.2.3   Multi company management (*)

The module is used to define different access levels to the system and increase data security by defining a network of sites and companies.
This package also allows:
*   detail monitoring of maintenance activities;
*   display of geolocation maps;
*   creation of custom site pages.
*Module RVSTDRM000 "Remote maintainer" is a pre-requisite

1.2.4   NRGdash – Energy Benchmark (*)

Energy analysis module. This offers the following functions:
*   comparison of energy, water, gas usage;
*   detailed dashboard of system performance;
*   parameter broadcasting (remote setting).

*Modules: RVSTDDM000 "Centralised data management" and RVSTDRV000 "Multi company management" are pre-requisites.

1.3   Main functions

1.3.1   Access to local supervisors via Internet
RemotePRO can acts as the connection between the outside world and a protected network supervisors, providing users with access while at the same time guaranteeing a high level of security.
Two examples of this architecture are:
1. external access (via Internet) to the local network: the local supervisors are protected inside the customer's private network. The only device exposed to the Internet is the RemotePRO server;
2. access via VPN: the local supervisors are connected to (different) private networks. The RemotePRO server is the only device that can communicate with these networks, over secure "point-to-point" connections (VPN).

In both situations, the local supervisors that were otherwise not accessible except from a single point of access, are now available to authorised users.
In these situations RemotePRO guarantees a high level of security, as the local supervisors are not exposed and HTTP/HTTPS communication to the supervisors (the only type permitted) is filtered.

1.3.2   Synchronisation
The operation that allows RemotePRO to receive information regarding supervisor and alarm configuration is called synchronisation.
There are three main stages to the process:
1. authentication: the local supervisor identifies itself to RemotePRO;
2. RemotePRO queries the supervisor for its configuration:
    - list of connected devices (compete with description, model and information on the line and address);
    - list of variables pertaining to which RemotePRO will receive alarms or data;
3. RemotePRO also queries the supervisor for the list of alarms that have been activated.

When synchronising the first time, RemotePRO requests the complete configuration of the local supervisor, which includes:
• all connected devices;
• all alarm variables relating to alarms that have been activated;
• all logged variables (these are configured on the local supervisor to be shared with RemotePRO);
• all alarms that have been activated in the past (maximum 5 days).

When synchronising the next time and subsequently, RemotePRO will only request new information or any changes to the previous data.
If more than 5 days have elapsed since the previous synchronisation, the complete list of activated alarms will not be requested, but rather only a part of it.

Synchronisation can be started in different ways:
• via notification rules at the start/end of an alarm situation on the supervisor (recommended).
• manually from RemotePRO;
• manually from the local supervisor (with connection test to RemotePRO);
• scheduled at regular intervals on the local supervisor.

1.3.3   Life test
The life test is the procedure used by RemotePRO to check access to the local supervisors and network status. There are two types of test:
1. Outgoing life test: RemotePRO periodically attempts to connect to the local supervisors and check that they can be accessed.
    After the user has set the number of daily tests, the system will distribute these uniformly throughout the day, starting from the first test at midnight. RemotePRO will sequentially poll all of the supervisors on which the outgoing life test is configured. For example, if 4 tests have been configured, these will be performed at: 00:00, 06:00, 12:00, 18:00, before starting over again at 00:00 the next day.
2. Incoming life test: the local supervisors, when suitably configured, will periodically contact RemotePRO, and the latter verifies that a connection has been established.
    In this case, the aim is to configure the local supervisors to call RemotePRO in set time bands. The number of time bands can be set, and will be divided into intervals of equal duration throughout the day. At the end of each interval, RemotePRO will verify that all the supervisors on which the incoming life test has been configured have made at least one call. For example, if 4 tests have been configured, the system will verify that the supervisors connect at least once between 00:00 and 06:00, 06:00 and 12:00, 12:00 and 18:00 and finally 18:00 and 00:00 the next day, before then starting over again.

1.3.4   Data alignment
The data alignment function is used to download to RemotePRO the logged data relating to a subset of variables on the local supervisor. The list of these variables is configured individually on each supervisor (for details on the configuration procedure, see the manual for the specific supervisor). Data alignment is an automatic process that is performed, depending on the configuration, from one to three times a day (i.e. every 24, 12 or 8 hours) starting at a set time. Data alignment thus makes the variable logs directly available on RemotePRO, without needing to connect to the supervisor. The same data can be used for certain operations, such as export, display graphs, analysis and KPI calculation.

1.3.5   Guardian
The "Guardian" function enables a process that verifies the correct operation of RemotePRO. If problems occur, the Guardian signals the malfunction via email, and if the problem persists may attempt to solve it by rebooting the server (if configured accordingly).

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1.4 Architecture

The supervisor network can be configured to manage different types of sites, with different needs. Examples include.

Situation 1: RemotePRO and local supervisors connected directly to the Internet with a public static IP address or the same DNS name. On each network (LAN: Local Area Network) there is a firewall to prevent intrusion. The user can check the entire site from just one point, avoiding the need for direct connections to each local system. The local supervisors can be accessed directly to acquire data for detailed analysis only when required.
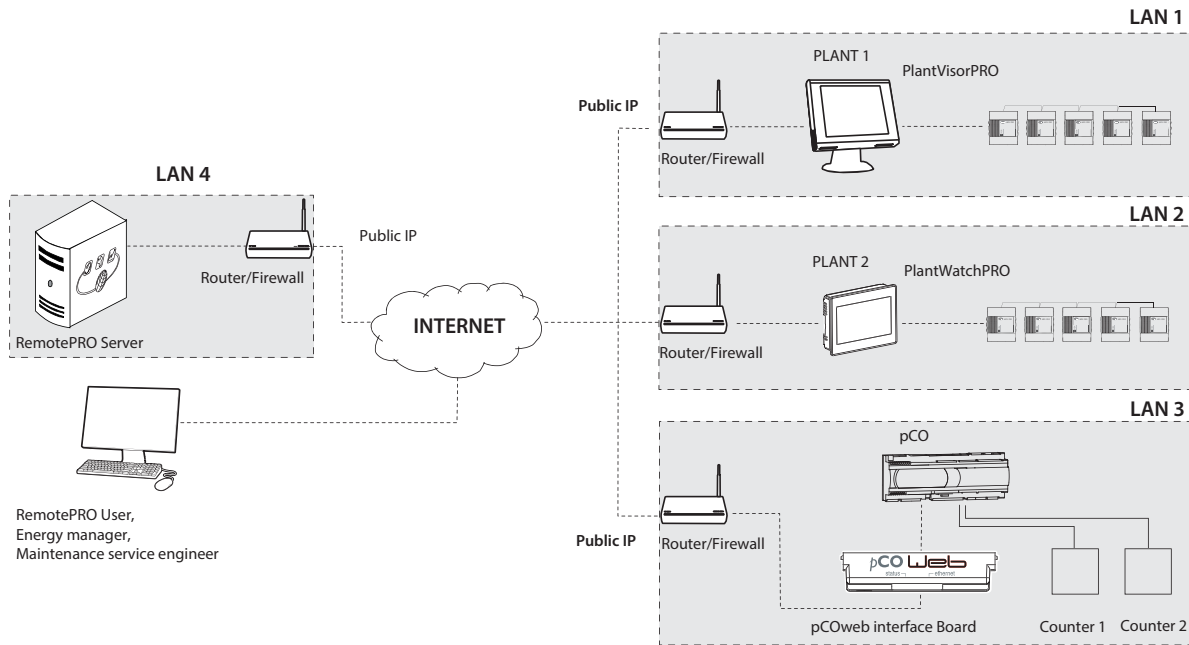

Fig. 1.a

Situation 2: the customer has a private network that the local supervisors are connected to. RemotePRO is installed on a different network, for example, the service network. The two networks are connected via a permanent VPN tunnel. Users who wish to manage alarms and process the data can access RemotePRO using a public static IP address.
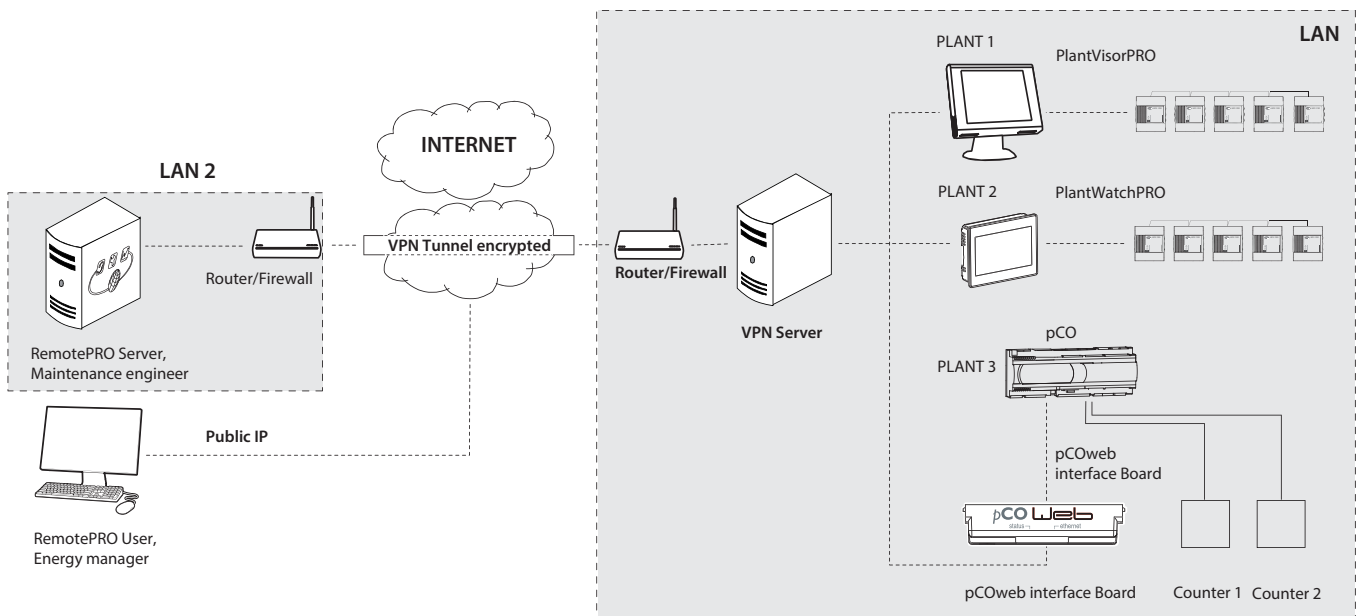
Fig. 1.b

Situation 3: both the local supervisors and RemotePRO server are installed on the customer's network. External users can access via the server's public IP or a VPN tunnel connection, for example to check alarm status or connect directly to each supervisor.

Fig. 1.c

Situation 4: same as situation 3, with the difference that users can access from the outside using the RemotePRO server's public address, meaning RemotePRO is the only exposed device outside of the LAN.

Fig. 1.d

2. NAVIGATION

A web browser is used to navigate the interface (see the technical specifications for compatible browser). The RemotePRO interface is available in different languages. The access language is the one the user has selected as the default. Nonetheless, the display language can be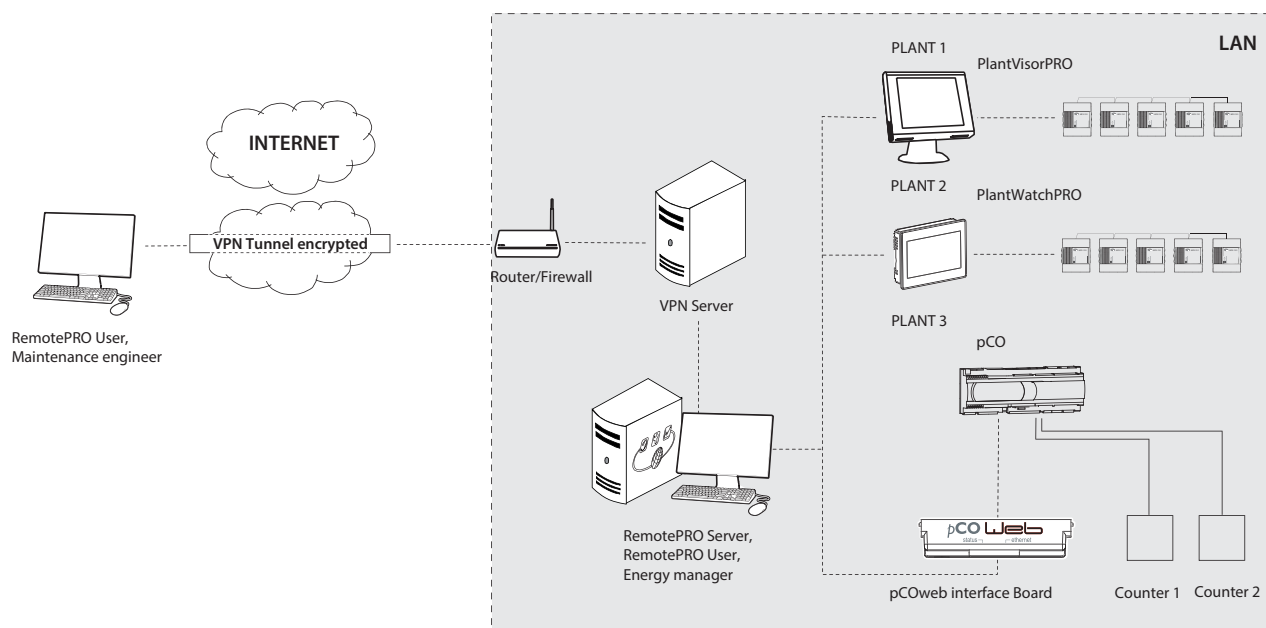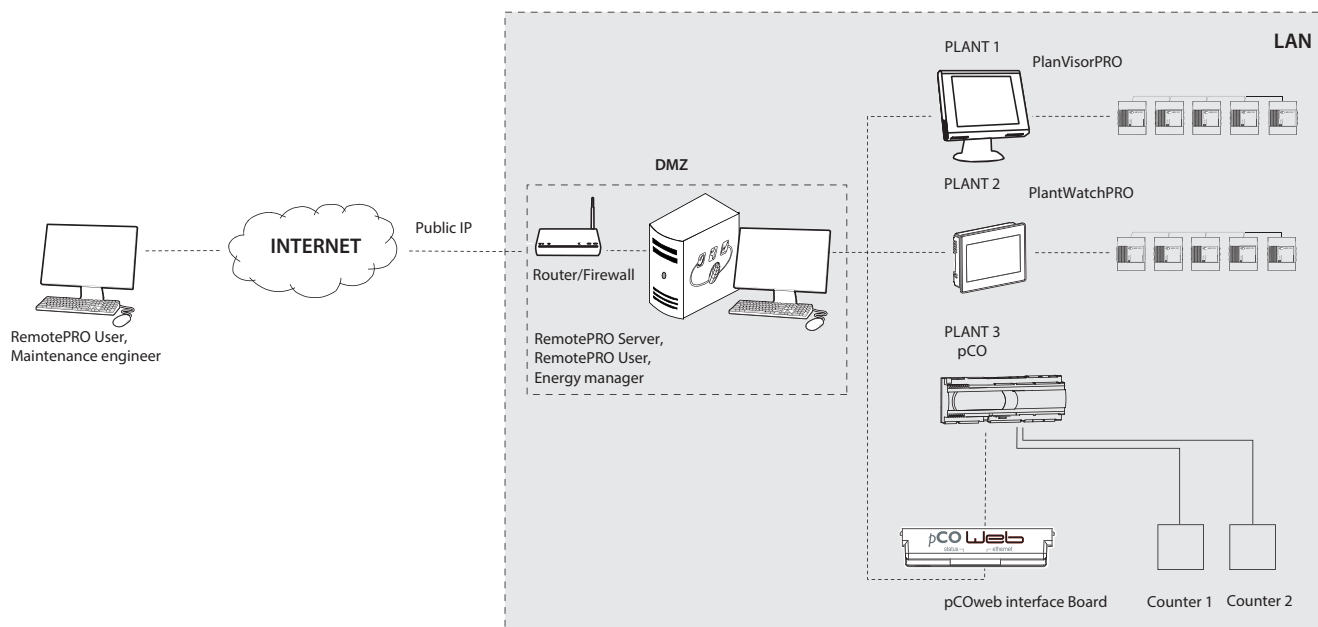 changed via the drop-down menu provided. Each user is assigned a profile (administrator, installer, maintenance, user) that determines what information is displayed and what operations are permitted.

2.1 Header

The top part of the graphic interface shows a series of sections that are common to each page and are used to quickly access the main information:

Fig. 2.a

1	Connected user	9	Quick access buttons:
2	User's company name	A	Supervisor status
3	Current language/change language	B	Active alarms
4	Event notification area	C	Priority synoptic (reset alarms)
5	Navigation path	D	Usage benchmarks
6	Available pages	E	Temperature compliance
7	System messages	F	Logout
8	Function buttons		

2.2 Page body

In general, the pages can be divided into two main categories:
1. List pages: the records are grouped in tables with filtering, sorting and page display options;
2. Detail pages: double clicking a row in a table accesses complete information on that record, as well as allowing a number of basic functions (create, display, edit, delete)

2.3 List page

These pages show a list of uniform information (for example on supervisors, alarms or users). The data displayed can be filtered by applying the criteria available at the top of the page.

Fig. 2.b

1	Data refresh timer (with pause/restart)	7	Scroll pages
2	Filter parameters	8	▼/▲/▽ ort button (active increasing order/active decreasing order/not active)
3	Button to click for a help list on the specific field	9	Column headers
4	Calendar button	10	Tooltip (*)
5	Function buttons relating to the rows (after having selected with ▢)	11	Export data in Excel/PDF format
6	No. of rows displayed per page		

(*) When moving the cursor over certain areas, a tooltip is displayed with additional information.

2.4 Detail page

Double clicking a row on a list page accesses the corresponding detail page. This page displays more complete information on the record. The detail page can be used to edit the information or perform specific operations:

Fig. 2.c

1	Data in detail	3	Function buttons (header)
2	The asterisk indicates required fields	4	Audit data, relating to when the element was created or edited

⊙ **Note:** If navigating on a mobile device, the double click is replaced by a *long press.*

2.5 Elements to support navigation

On the pages are a number of elements (*widgets*) that allow the interface to be used more quickly, simplifying the operations to display, enter or select the data.

2.5.1 Navigation path

On each list page, the details of a record can be accessed by double clicking the row (example: site details). Once having accessed the detail page, the tabs provide different levels of detail (for example, details of a supervisor at a specific site). To track these steps, the complete path is shown on the page header, with the various details
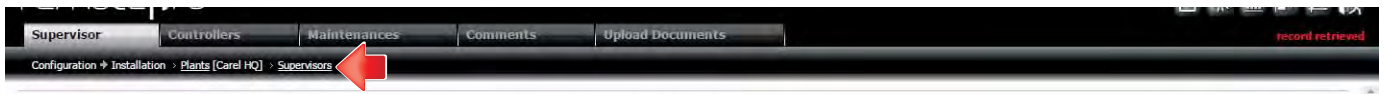
Fig. 2.d

⊙ Each underlined item is a *link* that can be used to go back along the path.

2.5.2 Help list

To select an element from a long list of set values, click ⬜ to open a new overlapping window. Subsequently, by double clicking the desired row, the related value is entered in the field.
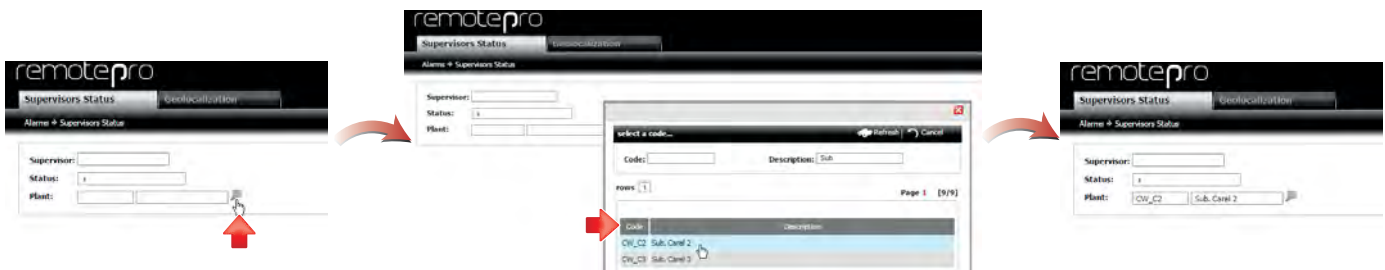

Fig. 2.e

2.5.3 Calendar

Dates can be entered manually (using the conventional format of the display language), or using a calendar (🗓 button).

Fig. 2.f

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2.5.4 Tags

Tags are labels that can be applied to an entity so as to identify data much more easily when searching. For example, a site can be tagged according to the type, size or any given characteristic.

The following entities support the use of tags:

- plants (sites)
- supervisors
- devices
- model variables

The tags can be assigned both on the detail and the list page, typing a string directly (without spaces) or by pressing the button and selecting a tag from those entered previously for the same type of entity:
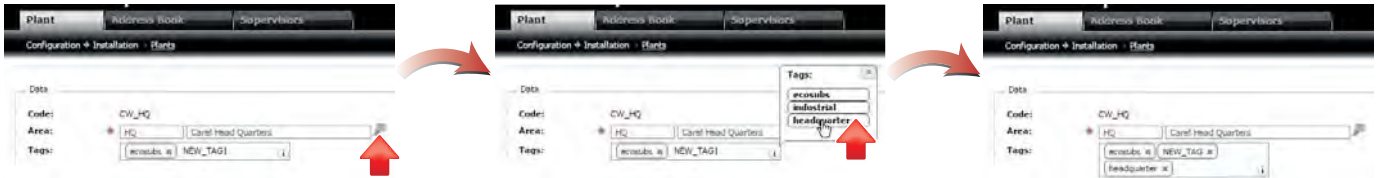
Fig. 2.g

2.6 Procedure

The RemotePRO interface has been designed to make operations uniform and simple from the very first time it is used. Interaction with the pages is managed in a uniform and repeatable manner. The main operations are also available for most of the transactions.

2.6.1 Data filters

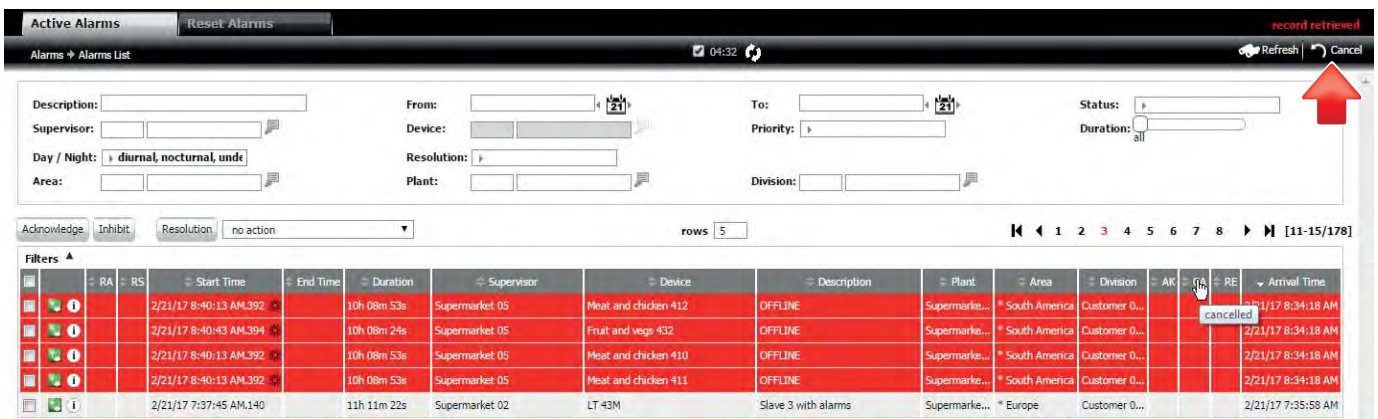Each list page a number of fields in the header to filter the data displayed.

Fig. 2.h

Procedure: display a subset of data

1. Set the values in the entry fields
2. Click "Refresh"

Note: when the procedure has been completed successfully, the message "record retrieved" is shown in the system message area.

Procedure: to reset the filter fields

1. Click "Cancel"

Note: when the procedure has been completed successfully, the message "record retrieved" is shown in the system message area.

2.6.2 Create

To enter a new entity in the system (area, maintenance operators, …) start on the corresponding list page and click the "new" button on the row to access the detail page with all the fields to be entered.

Fig. 2.i

Procedure: create a new entity

1. Click the "New" button
2. Enter the specific data for the new entity
3. Click the "New" button

Note: when the procedure has been completed successfully, the message "record created" is shown in the system message area.

Important: if the procedure is NOT completed successfully, a description of the problem found is shown in the system message area.

2.6.3 Delete

An entity can be deleted on its detail page:

Fig. 2.j

Procedure: delete an entity from the detail page
1. Click the "Delete" button ▬
2. Click "OK" in the confirmation popup

▶ **Note:** when the procedure has been completed successfully, the message "RECORD DELETED" is shown in the system message area.

⚠ **Important:** if the procedure is NOT successful, the problem found is displayed in the system message area.

A second option, especially useful for multiple deletions, is available directly on the list page:
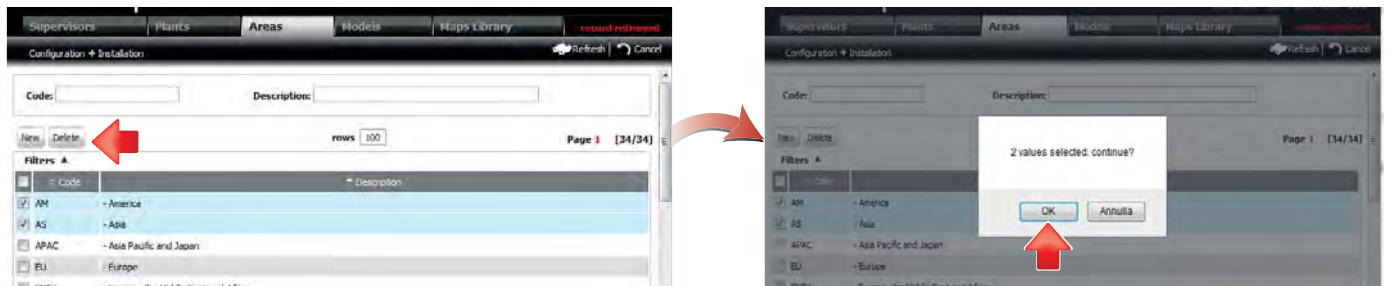

Fig. 2.k

Procedure: delete an entity from the list page
1. Select the rows to be deleted using the corresponding checkboxes ☐
2. Click the "Delete" button Delete
3. Click "OK" in the confirmation popup

▶ **Note:** when the procedure has been completed successfully, the message **"RECORD DELETED"** is shown in the system message area.

⚠ **Important:** if the procedure is <u>NOT</u> completed successfully, a description of the problem found is shown in the system message area.

2.6.4 Edit

Entities can also be edited in two different ways. The first is from the detail page, accessed by double clicking the desired row. This option is available for all entities that can be configured:

Fig. 2.l

Procedure: edit an entity from the detail page
1. Edit the desired fields
2. Click the "Save" button ✓

▶ **Note:** when the procedure has been completed successfully, the message **"RECORD UPDATED"** is shown in the system message area.

⚠ **Important:** if the procedure is <u>NOT</u> completed successfully, a description of the problem found is shown in the system message area.

For some attributes of certain entities, for example where an overview of the changes being made is useful to manage the configuration more clearly, the data can be edited directly on the list page:

Fig. 2.m

Procedure: **edit an entity from the list page**
1. Edit the desired fields
2. Select the desired rows using the corresponding checkboxes
3. Click the "Update" button
4. Click "OK" if a confirmation popup is shown

⬤ **Note:** when the procedure has been completed successfully, the message **"record updated"** is shown in the system message area.

⚠ **Important:** if the procedure is NOT completed successfully, a description of the problem found is shown in the system message area.

⬤ **Note:** whenever editing a field corresponding to a row in a table, the row will automatically be highlighted in blue, the pencil will be displayed and the checkbox will be checked. This is to easily identify which rows have been edited and what changes have been made. If no changes are to be made to a specific row, simply deselect the corresponding checkbox and proceed with the others.

2.6.5 Comments

For the main system entities (areas, maintenance operators, customers, sites and supervisors) a specific page is available for sharing useful information, note or general comments. From the entity's detail page, click the comments tab and write a new message directly in the area provided:

Fig. 2.n

Procedure: create a new comment
1. Enter the text in the editable area
2. Click the "New" button

⬤ **Note:** when the procedure has been completed successfully, the message **"record updated"** is shown in the system message area.

⚠ **Important:** if the procedure is NOT completed successfully, a description of the problem found is shown in the system message area.

Each comment created is added to a list shown immediately below the editable area. Comments can be created by different users and edited by all users with write access to the page.

Fig. 2.o

Procedure: edit a comment
1. Double click the row to be edited so as to display it in the editable area
2. Edit the text
3. Click the "Save" button

⬤ **Note:** when the procedure has been completed successfully, the message **"record updated"** is shown in the system message area.

⚠ **Important:** if the procedure is NOT completed successfully, a description of the problem found is shown in the system message area.

⬤ **Note:** comments are deleted in the same way as deleting any other entity from the list page.

2.6.6 Upload documents

RemotePRO stores a centralised archive of commonly-used documents on the sites and systems, such as manuals, diagrams and specifications.
From the entity's detail page, access the documents tab and then load a new file:

Fig. 2.p

Procedure: upload a new document

1. Click the "Upload" button , a popup will be displayed
2. Enter the description of the file
3. Click Choose File
4. Select the file to upload
5. Click the "Upload" button

> **Note:** when the procedure has been completed successfully, the message **"record created"** is shown in the system message area.

> **Note:** the button for selecting the files may change according to the browser used.

The uploaded documents will then be available at any time to all authorised users, and can be downloaded to the connected device:
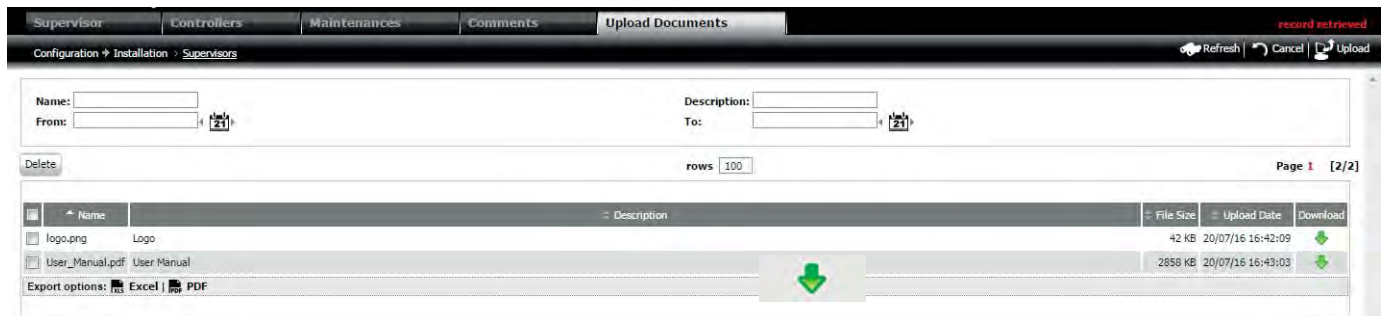

Fig. 2.q

Procedure: download di a new document

1. Click the green arrow on the desired row

> **Note:** Documents are deleted in the same way as deleting any other entity from the list page.

2.7 Menu

The navigation menu to access all of the pages is always displayed at the bottom of the pages. The fully expanded menu (when all the modules are active) is described below

Alarms	Usage	Performance	Reports	Configuration	Activities
Supervisor status Alarms list Priority synoptic Maintenance rating System register	Benchmarks Details Configuration	Temperature compliance Configuration	Export reports Reports archive Configuration	Plant Company Contacts Administration Access Channel	Rules engine Variables Parameter broadcast

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2.8 User profiles

System security is guaranteed by access via credentials and management of user profiles (roles) to define the level of authorisation. Each authenticated user is assigned one or more roles. The set of operations that each user can perform depends on which roles have been assigned. The general rule is: administrators have access to all of the functions; the other profiles have read/write access to the functions inherent to their specific tasks:

1. installers connect the devices and load their templates;
2. maintenance operators manage alarms, check graphs and schedule reports;
3. users do not modify the system, but can create reports, display and export data.

Alarms

	User	Maintainer	Installer	Administrator
⊢ Supervisors Status				
⊢ Supervisors Status	read + connect + export	read + connect + export	read + connect + export	read + connect + export
⊢ Supervisor Status Detail	read + view custom map	r/w + syncro + align + r/w vars	r/w + syncro + align + r/w vars	r/w + syncro + align + r/w vars
∟ Controllers	read + export	read + export	read + export	read + export
∟ Log Data Graph	read + export	r + export + align + manage graph	r + export + align + manage graph	r + export + align + manage graph
⊢ Local Events	read + export	read + export	read + export	read + export
∟ Local Notes	read + export	read + export	read + export	read + export
∟ Geolocalization	read + view custom map	read + view custom map	read + view custom map	read + view custom map
⊢ Alarms List				
⊢ Active Alarms	read + connect + export	r + connect + export + manage alarm	r + connect + export + manage alarm	r + connect + export + manage alarm
∟ Alarm Detail	read + notes + connect	r + connect + manage alarm + r/w notes	r + connect + manage alarm + r/w notes	r + connect + manage alarm + r/w notes
∟ Reset Alarms	read + connect + export	r + connect + export + resolution	r + connect + export + resolution	r + connect + export + resolution
∟ Alarm Detail	read + notes + connect	r + connect + manage alarm + r/w notes	r + connect + manage alarm + r/w notes	r + connect + manage alarm + r/w notes
⊢ Priority Synoptic				
⊢ Reset	read + export	read + export	read + export	read + export
∟ Active	read + export	read + export	read + export	read + export
⊢ Maintenance Rating				
⊢ Reset/Resolution	read + export	read + export	read + export	read + export
⊢ Active/Resolution	read + export	read + export	read + export	read + export
⊢ Service	read + export	read + export	read + export	read + export
∟ Plant	read + export	read + export	read + export	read + export
∟ System Registry				
⊢ Events	read + export	read + export	read + export	read + export
∟ Configurations History	x	x	read	read
∟ Configurations History Detail	x	x	read	read

Usage

	User	Maintainer	Installer	Administrator
⊢ Benchmark				
⊢ Benchmark	read + export + schedule	read + export + schedule	read + export + schedule	read + export + schedule
⊢ Analysis	read + export + schedule + add vars	read + export + schedule + add vars	read + export + schedule + add vars	read + export + schedule + add vars
∟ Report Templates	read + export + write	read + export + write	read + export + write	read + export + write
∟ Report Detail	read + write	read + write	read + write	read + write
⊢ Detail				
⊢ Plant	read + export	read + export	read + export	read + export
⊢ Supervisor	read + export	read + export	read + export	read + export
⊢ Device	read + export	read + export	read + export	read + export
⊢ Kpi Templates	read + export + write	read + export + write	read + export + write	read + export + write
∟ Kpi Template Detail	read + write	read + write	read + write	read + write
∟ Kpi Configuration	x	x	x	read + write + restore default
⊢ Configuration				
⊢ Plant	x	x	read + write	read + write
⊢ Supervisor	x	x	read + write	read + write
⊢ Energy	x	x	read + export + write + elab	read + export + write + elab
⊢ Water	x	x	read + export + write + elab	read + export + write + elab
∟ Gas	x	x	read + export + write + elab	read + export + write + elab

Performance

	User	Maintainer	Installer	Administrator
⊢ Temperature Compliance				
⊢ Period	read + export	read + export	read + export	read + export
⊢ Daily	read + export	read + export	read + export	read + export
∟ Period per Device	read + export	read + export	read + export	read + export
⊢ Kpi Templates	read + write + export	read + write + export	read + write + export	read + write + export
∟ Kpi Templates Detail	read + write	read + write	read + write	read + write
∟ Kpi Configuration	x	x	x	read + write + restore default
∟ Configuration				
∟ Thresholds	x	x	read + export + write + elab	read + export + write + elab

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Performance

	User	Maintainer	Installer	Administrator
⊢ Temperature Compliance				
⊢ Period	read + export	read + export	read + export	read + export
⊢ Daily	read + export	read + export	read + export	read + export
∟ Period per Device	read + export	read + export	read + export	read + export
⊢ Kpi Templates	read + write + export	read + write + export	read + write + export	read + write + export
∟ Kpi Templates Detail	read + write	read + write	read + write	read + write
∟ Kpi Configuration	x	x	x	read + write + restore default
∟ Configuration				
∟ Thresholds			read + export + write + elab	read + export + write + elab

Reports

	User	Maintainer	Installer	Administrator
⊢ Export Report	submit export	submit export	submit export	submit export
⊢ Reports Archive	read + export + download	read + export + download	x	read + write + export + download
∟ Configuration				
⊢ Scheduled Reports	read + export + write	read + export + write	read + export + write	read + export + write
∟ Scheduled Report Detail	read + write	read + write	read + write	read + write
∟ Report Templates	read + export + write	read + export + write	read + export + write	read + export + write
∟ Report Template Detail	read + write	read + write	read + write	read + write

Configuration

	User	Maintainer	Installer	Administrator
⊢ Installation				
⊢ Supervisors	x	x	read + export + write	read + export + write
⊢ Supervisor Detail	x	x	read + syncro + alignment + write	read + syncro + alignment + write
⊢ Controllers	x	x	read + export + change model	read + export + change model
∟ Controller Detail	x	x	read + write	read + write
⊢ Comments	x	x	read + write + export	read + write + export
∟ Upload Documents	x	x	read + write + export + download	read + write + export + download
⊢ Plants	x	x	read + write + export	read + write + export
⊢ Plant Detail	x	x	read + write	read + write
⊢ Comments	x	x	read + write + export	read + write + export
∟ Upload Documents	x	x	read + write + export	read + write + export
⊢ Areas	x	x	read + write + export	read + write + export
∟ Area Detail	x	x	read + write	read + write
∟ Models	x	x	read + export + upload + write	read + export + upload + write
∟ Variable Model	x	x	read + export + upload + write	read + export + upload + write
∟ Maps Library	x	x	read + write + upload	read + write + upload
∟ Map Library Detail	x	x	read + write + upload	read + write + upload
⊢ Company				
⊢ Customers	x	x	read + write + export	read + write + export
⊢ Customers Detail	x	x	read + write	read + write
⊢ Comments	x	x	read + write + export	read + write + export
∟ Upload Documents	x	x	read + write + export	read + write + export
∟ Maintenances	x	x	read + export	read + export
⊢ Maintenance Detail	x	x	read	read
⊢ Comments	x	x	read + write + export	read + write + export
∟ Upload Documents	x	x	read + write + export	read + write + export
⊢ Address Book	x	x	read + export + write	read + export + write
∟ Contact	x	x	read + write	read + write
⊢ Administration				
⊢ Modules	x	x	x	read + write + export
⊢ System	x	x	x	read + write + syncro + align
⊢ Edit i18n	x	x	x	read + write
∟ Log file export	x	x	x	read + write + export
⊢ Access				
⊢ Change User Data	read + write	read + write	read + write	read + write
∟ Local Users	x	x	x	read + export + write
∟ Local Users Detail	x	x	x	read + write
∟ Channel				
⊢ Email Configuration	x	x	x	read + write + test
∟ LAN Configuration	x	x	x	read + write

Activity

	User	Maintainer	Installer	Administrator
⊢ Rules Engine				
⊢ Notification Groups	x	read + export	x	read + export
⊢ Notification Group Detail	x	read	x	read
∟ Contacts	x	read + export	x	read + export
⊢ Rules	x	read + export	x	read + export
∟ Rule Detail	x	read	x	read
∟ Time Bands	x	read + export	x	read + export
⊢ Time Band Detail	x	read	x	read
∟ Notification Groups	x	read + export	x	read + export
⊢ Variables	x	x	x	read + write + export
∟ Parameters Broadcast				
⊢ Templates	x	read + write + export	x	read + write + export
∟ Template Detail	x	read + write + export + send	x	read + write + export + send
⊢ Broadcast Schedulations	x	read + write + export	x	read + write + export
∟ Broadcast Schedulation Detail	x	read + write	x	read + write
∟ Broadcast Operations	x	read + export	x	read + export
∟ Broadcast Operations Detail	x	read	x	read

3. SUPERVISOR CONFIGURATION

This chapter first of all describes the organisation of the multi-company environment and the visibility rules for exchanging information between the different roles (customers, maintenance operators). This is followed by a description of the site as a group of supervisors assigned to a specific area, and the supervisor as the basic unit that receives data from the monitored controllers. The final part describes how alarm notifications are managed: defined groups of users receive alarm signals via email during specified time bands.

3.1 Multi-company environment

The multi-company environment is used to create a network of sites and companies (customers and maintenance operators) and define different access levels to safeguard data security. Access to the data saved in RemotePRO must be restricted so as to:
- simplify operations for the specific user: for example, maintenance operators only see the restricted set of data that involve their tasks, without needing to search through irrelevant information;
- guarantee the confidentiality of sensitive data: each company must only be able to see the data for the sites it manages or owns.

To achieve these objectives, the network of supervisors connected to the remote system is divided into different areas, and each site is assigned to its owner (customer).
Once the configuration procedure has been completed:
- maintenance operators can access all the sites situated in the area assigned to their company;
- different maintenance companies can manage the same group of sites (they can be assigned to the same area);
- the customer only sees the supervisors belonging to their company.

Example:
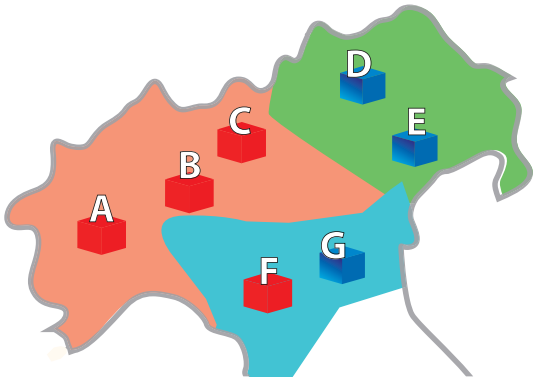
Plants and maintenance companies are linked together by the "pertinent area" attribute. Consequently, maintenance companies that operate in the orange/green/blue areas shown in the following example only see the sites (and the corresponding supervisors) located in the corresponding area, even if they belong to different customers.

As regards customers, see the following table:

Customer Visibility: site/area	Customer 1 - blue	Customer 2 - red
	D / green	A / orange
	E / green	B, C / orange
	G / blue	F,/ blue

In summary, once having created the customers, areas, maintenance operators and sites as shown in the previous diagram:
1. customer 1 (blue) will only see sites: D, E, G;
2. customer 2 (red) will only see sites: A, B, C, F;
3. the maintenance companies operating in the orange area will see sites: A, B, C;
4. the maintenance companies operating in the green area will see sites: D, E;
5. the maintenance companies operating in the blue area will see sites: F, G.

3.2 How to configure the environments

The main entities that define a working environment are areas, customers, maintenance operators and sites (plants). It is important to define these appropriately from the start, in order to correctly and easily access all of the data and suitably manage authorisations.

3.2.1 Area

Areas are a simple way to group different sites together. The definition of areas is quite flexible: for example, labels can be used to identify geographical regions, or the area can be named after the company that operates there.

Menu path: Configuration → Installation → Areas

LIST PAGE

Fig. 3.a

DETAIL PAGE

Fig. 3.b

Field	Description		Field	Description
Code	Area code		Description	Description of the area

The procedures for creating and deleting areas are similar to those described under *"Navigation".*

⚠ **Important:** if there are sites associated with an area, that area cannot be deleted. The following message will be shown in the system message area: "Check linked entities". To unlink a site from an area, go to: **Configuration → Installation → Plants** and assign the site (plant) to a new area.

3.2.2 Customers

Customers are the companies that own or operate one or more sites.

Menu path: Configuration → Company → Customers

LIST PAGE

Fig. 3.c

DETAIL PAGE

Fig. 3.d

Field	Description		Field	Description
Code	Customer code		Description	Description of the customer
Address	Telephone number, address, email		City	Telephone number, address, email
ZIP code			Country	
VAT number			Tax code	
Telephone			Fax	
Email			Mobile	
Notes				

The procedures for creating and deleting customers are similar to those described under "Navigation".

⚠ **Important:** in the event where there are sites (plants) associated with a customer, that site cannot be deleted. The following message will be shown in the system message area: "Check linked entities".

To unlink a site from a customer, go to:

Configuration → Installation → Plants
and assign the site to new customer. If the record is deleted successfully, the message "Record deleted" is shown.

CAREL

3.2.3 Maintenances

Maintenance operators or engineers (maintenances) are the companies responsible for the maintenance of one or more sites.

Menu path: Configuration → Company → Maintenances

LIST PAGE
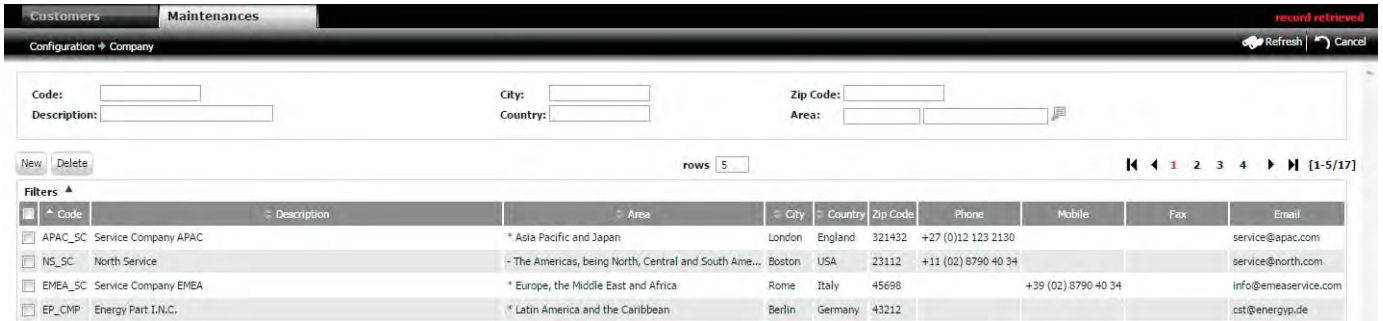
Fig. 3.e

DETAIL PAGE

Fig. 3.f

Field	Description	Field	Description
Code	Customer code	Description	Description of the customer
Address	Telephone number, address, email	City	Telephone number, address, email
ZIP code		Country	
VAT number		Tax code	
Telephone		Fax	
Email		Mobile	
Notes			

The procedures for creating and deleting customers are similar to those described under "Navigation".

3.2.4 Impianti

L'impianto rappresenta un sito dove sono installati 1 o più supervisori.

Menu path: Configuration → Installazion → Plants

LIST PAGE
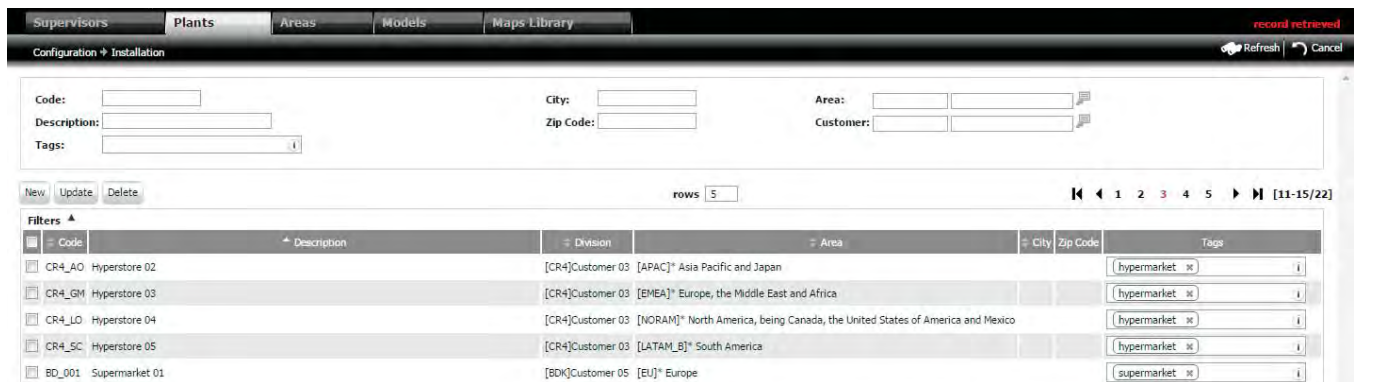
Fig. 3.g

DETAIL PAGE
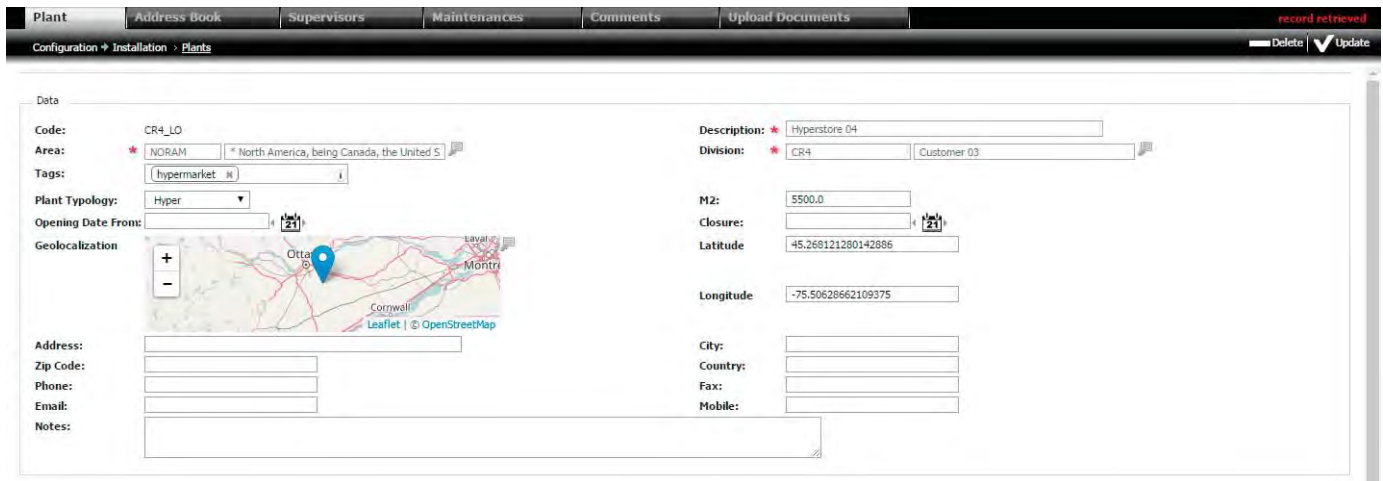
Fig. 3.h

Field	Description		Field	Description
Code	Site code		Description	Description
Area	Area the site belongs to		Customer	Site owner/operator
Type of site	Hypermarket, Super, Convenience, Express, Discount, Cold store, Other		M2	Site normalisation factor (for e.g. m2)
Opening date from	Date the site opened		Closing	If closed, date the site was closed
Latitude	Geolocation coordinate		Longitude	Geolocation coordinate
Address	Address, telephone, email		City	Address, telephone, email
ZIP code			Country	
Telephone			Fax	
Email			Mobile	
Notes				

Plant opening

Type (open 24 hours a day)	Yes/no			
Start alarm	Start time of the "day" alarm time band		End alarm	End time of the "day" alarm time band

SLA (Service Level Agreement) Maintenance (Hours)

Very high	Number of hours within which maintenance operators must manage alarms with the specified priority
High	
Medium	
Low	

⚠ **Important:** if deleting a site, the data relating to all the supervisors on that site will be lost.

🔵 **Note:** the type of site, opening time and normalisation factor (B) are useful parameters for comparing different sites in terms of energy consumption (see the chapter on consumption KPIs). To change the normalisation factor, go to Usage -> Detail -> (tab) KPI configuration: "label of normalised value";

🔵 **Note:** the opening time is used to classify alarms as day (sun icon in: Alarms -> Alarms list) or night (moon icon).

🔵 **Note:** the definition of the "Service Level Agreement" for the site affects the percentage of alarms resolved based on priority. This is used to compare the performance of different maintenance companies (see paragraph" Maintenance rating").

The procedures for creating and deleting customers are similar to those described under "Navigation".

<u>Procedure:</u> enter exact position (geolocation) of the site
1. enter the latitude and longitude coordinates;
2. click the save button ☑

🔵 **Note:** when the procedure has been completed successfully, the message **"record updated"** is shown in the system message area.

<u>Procedure:</u> site position by map
1. click 📧 ;
2. search for the desired point on the map
3. click the point

Fig. 3.i

🔵 **Note:** when the procedure has been completed successfully, the message **"RECORD UPDATED"** is shown in the system message area.

3.3 Supervisor detail

Each supervisor represents an individual supervisory system and belongs to a specific site.

3.3.1 Supervisors

Menu path: Configuration → Installazion → Supervisors (double click the supervisor row)

DETAIL PAGE
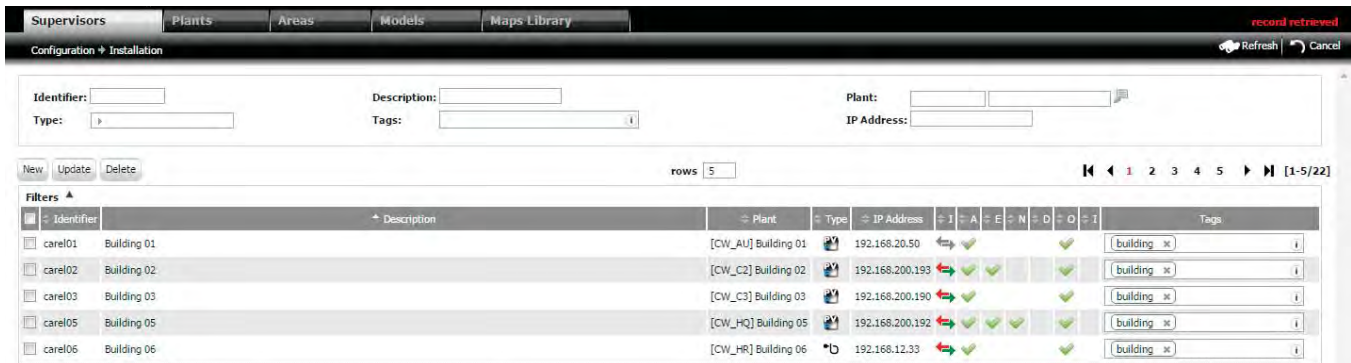
Fig. 3.j

LIST PAGE
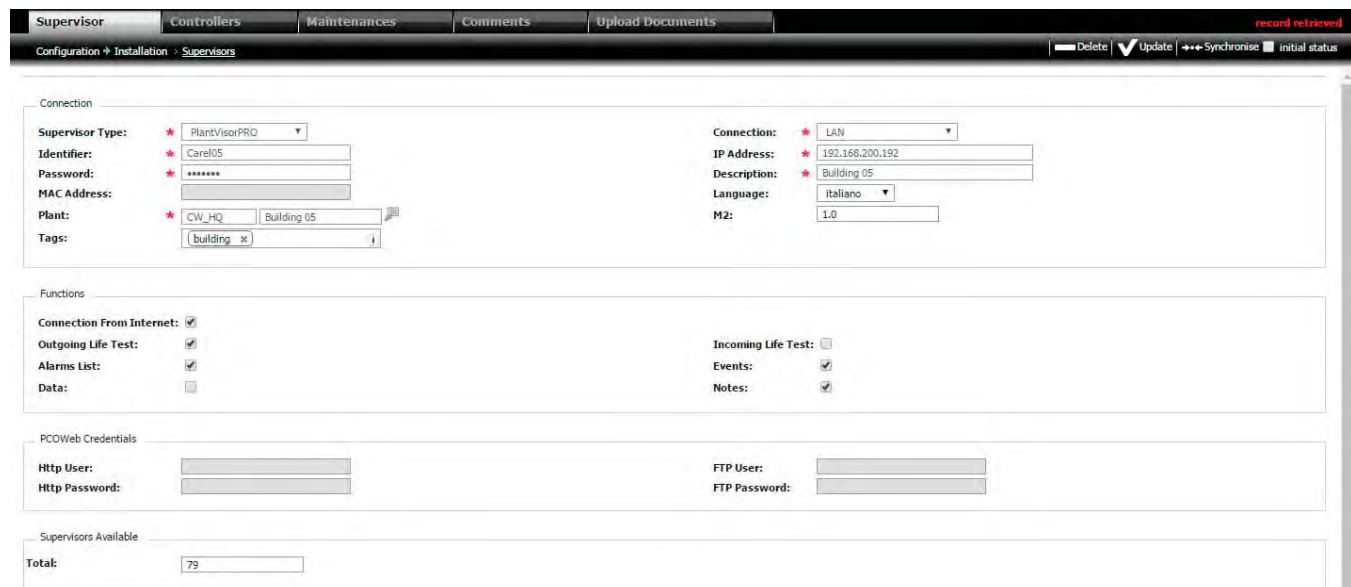
Fig. 3.k

Connection

Type of supervisor	boss, pCOWeb, PlantWatchPRO, PlantVisorPRO, PlantVisor Enhanced	Connection	Type of channel used for communication
Identifier	Unique identification string inside RemotePRO. This is used together with the password to validate incoming and outgoing connections to the supervisor in question. If these data do not correspond to those set on the supervisor interface, no connection will be established.	IP address	Supervisor's IP address. A DNS record can also be entered (e.g.: supervisor.carel.com). If the type of connection is "Dynamic IP", enter the last known IP, as this is temporary.
Password	This is used together with the identifier to validate incoming and outgoing connections to the supervisor. If these data do not correspond to those set on the supervisor interface, no connection will be established.	Description	Extended description, e.g. name/ address of the site
MAC address	Unique alphanumeric identification code of the network card. Only for "pCOWeb" supervisors.	Language	Defines the language used to download the descriptions of the variables and controllers.
Plant	Site the supervisor belongs to	M2	Normalisation factor (e.g. square metres)
Tags	Tags (labels entered by the user for filtering the data)		

Functions (synchronisable information)

Connection from Internet	Makes the supervisor accessible via HTTPS using the IP public of the RemotePRO. This is used for outside access (typically via the internet) to supervisors installed on private networks, yet communicating with RemotePRO.		
Outgoing life test	Enable the life test "from RemotePRO to the supervisor"	Incoming life test	Enable the life test "from the supervISOR to RemotePRO"
Alarms list	Enable alarm download during synchronisation.	Events	Enable event download during synchronisation.
Data	Enable variable value download during alignment	Notes	Enable note download during synchronisation.

pCOWeb credentials

Http user	Access credentials for "pCOWeb" supervisors.	FTP user	Access credentials for "pCOWeb" supervisors.
Http password		FTP password	

Supervisors available

Total	Number of supervisors still available to be entered. This number depends on the license that has been activated.

The procedures for creating and deleting customers are similar to those described under "Navigation".

Procedure: alarm synchronisation

This has the purpose of downloading the site configuration to RemotePRO; also downloaded are alarms, events and notes that are no more than 5 days old. If the "initial status" flag is selected, complete synchronisation is performed, so as to download all the data and restore any errors (missing configurations, lost alarms, ...) that may have occurred following extended connectivity problems between RemotePRO and the local supervisors:

synchronisable information					synchronisable information			
Supervisor type	Notes	Data	Events	Alarms	Supervisor type	Notes	Data	Events	Alarms
boss	YES	YES	YES	YES	PlantWatchPRO	NO	YES(*)	YES	YES
PlantVisorPRO	YES	YES	YES	YES	pCOWeb	NO	YES	NO	YES
PlantVisorEnhanced	NO	YES	NO	YES					

Procedure:

1. select, if necessary, the checkboxes "Initial status"
2. click on "synchro" button

⬤ **Note:** when the procedure has been completed successfully, messages with process descrption appear.

(*) from the 2.1 version

Procedure: data alignment

This has the purpose of downloading to RemotePRO the data corresponding to the logged variables for the devices connected to the local supervisors.
1. click on "aligmant data" button

3.3.2 Controllers

Display/edit the data for the controllers/devices connected to the local supervisor.

Menu path: **Configuration → Installation → Supervisors →**(double click the row) **→ Controllers**

Fig. 3.l

Each device is associated with a model that describes its variables. Upon synchronisation with the local supervisor, RemotePRO automatically receives the model code. For older supervisors, customised models or standard models that are not available in RemotePRO, the device and model must be associated manually.

Procedure: assign a model to a controllers

1. for the desired rows, set the model code in the input field or select it from the help list
2. click on sul "modify" row

Procedure: assign the same model to multiple controllers

1. for the desired rows, set the model code in the input field or select it from the help list
2. select the checkboxes on the desired rows
3. click the "global model" button

Procedure: enable controller in the KPIs

This includes the device when calculating the alarm, usage and performance KPIs.
1. set the KPI field to YES
2. click on sul "modify" row

3.4 Models

The devices (controllers and energy meters) send data to the local supervisor corresponding to the required variables, specified by an address that depends on the protocol used (CAREL, ModBus®,…). To associate values with the corresponding variables, the supervisor uses models, generated for example using the 1Tool programming tool or Device Creator.

Examples: associate information with pCOWeb variables, display values from custom devices in the temperature and energy KPIs.

◐ **Note:** if the data is imported from files taken from a CAREL 1Tool project, a standard ZIP must be used (without password and without maximum compression), containing just two project files: *.2CF, *2CT.

Menu path: **Configuration → Installtion → Models**
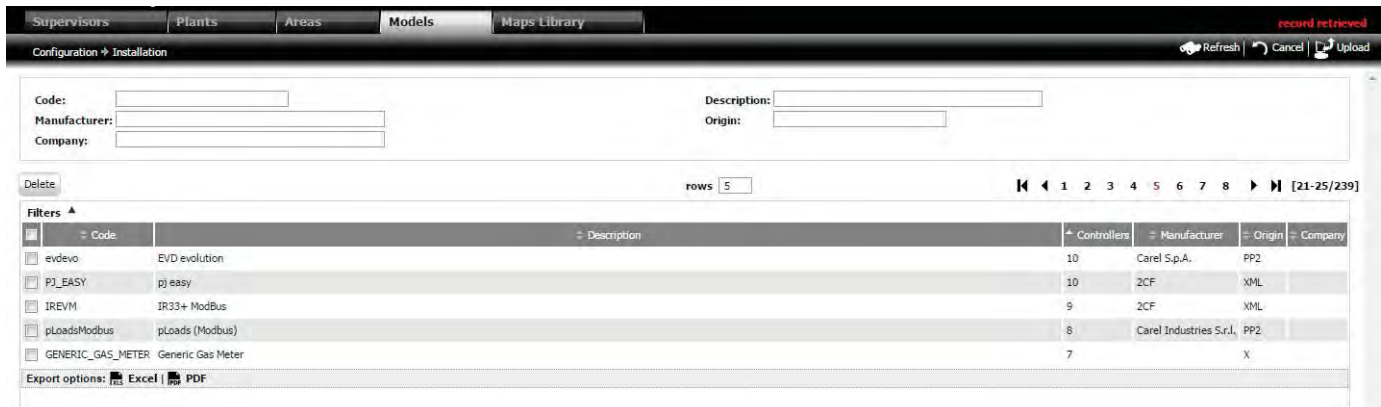
Fig. 3.m

<u>Procedure:</u> Import a new model
1. Click "Upload" to display the popup;
2. Enter the code, description, select the ZIP file, type, application protocol, language (which must be among those configured in the model) and the company;
3. Click "Upload" to complete the upload.

◐ **Note:** when the procedure has been completed successfully, the message **"record created"** is shown in the system message area.

◐ **Note:** the information that identifies a variable (type, address, length, size, bit position) must be unique in order to allow correct association with the devices.

Fig. 3.n

3.5 Remote management of local users

Remote management of local users is used to access all of the local supervisors without needing to repeat the configuration of individual users on each one separately. On RemotePRO there are two different components:
1. Centralised administration, to create and delete users from one or more local supervisors and change the access password;
2. Remote access to the data in real time, for using custom pages (see maps) and broadcast operations.

◐ **Note:** currently remote administration of local users is supported by the PlantVisorPRO (starting from version 2.0) and boss supervisors.

◐ **Note:** currently remote administration of local users is supported by the pCO Web (each version) (a starting from version 2.0) and boss supervisors.

The list displayed is in addition to the users already present on the supervisors, as existing users will not be deleted or overwritten, unless the users are created/edited/deleted at a local level.

Menu path: **Configuration → Access→ Local users**

Fig. 3.o
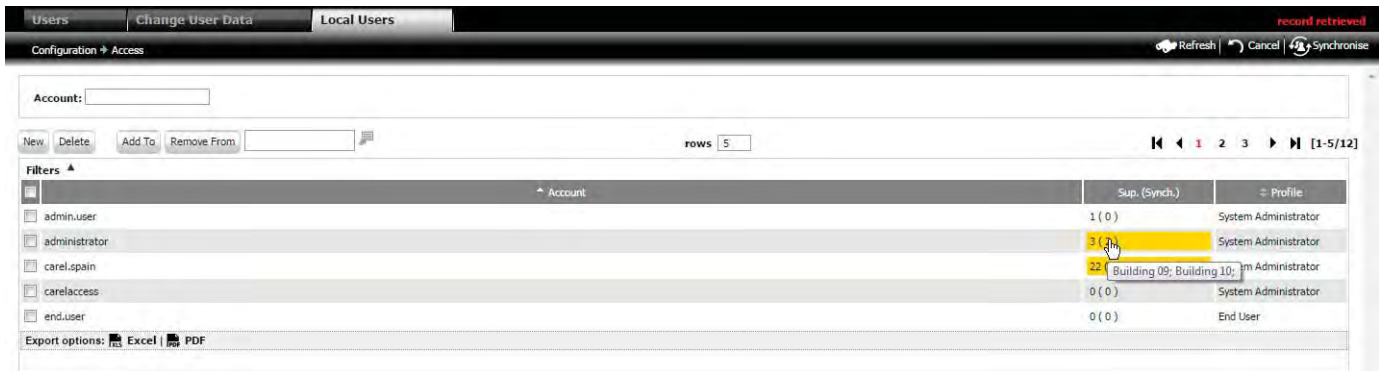
Field	Description
Account	User name
Sup.(Synch.)	Number of supervisors the user has been associated with. Those awaiting synchronisation are shown in brackets

Field	Description
Profile	Profile assigned to the user

🔵 **Note:** moving the mouse cursor over each figure shows the list of supervisors configured;

🔵 **Note:** the four standard PlantVisorPRO 2.0 profiles can be selected (System Administrator, Installer, Service, End User). The operations that can be performed on the supervisor with each user created will vary depending on the authorisations assigned to the specific profile on each supervisor.

🔵 **Note:**
- supervisors that support remote management of local users will be enabled to accept this function. To enable the function, see the specific manual for the supervisor used;
- as regards the operations carried out by RemotePRO, the rules are as follows:
  Create/edit a user:
  1. If the user does not exist on the local supervisor: a new user is created;
  2. If the user exists on the local supervisor: the existing user is edited.
  Delete a user:
  1. If the user does not exist on the local supervisor: no action;
  2. If the user exists on the local supervisor: the existing user is deleted.

Menu path: **Configuration → Access→ Local users**
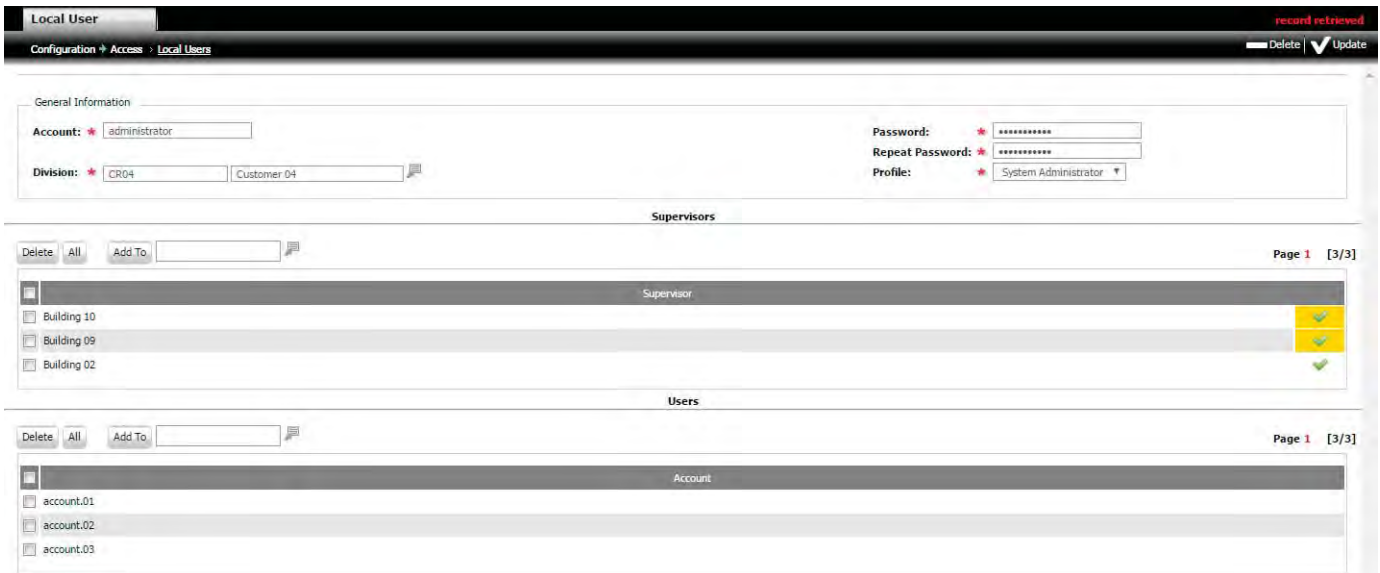
Fig. 3.p

Field	Description
Supervisor	Contains the supervisor selected from the list that opens when clicking it
Account	Local user username
Profile	Local user profile

Field	Description
Password	Password
Repeat password	Repeat password

Procedure: assign a supervisor to the local user

1. In the "Supervisors" section, click 🔲 to open the list of supervisors. Select the supervisor by double clicking;
2. Click (Add to) to assign the supervisor to the local user; this will be added to the list;

Procedure: remove a supervisor from the local user

1. Select the local user checkbox and click the button to remove the assignment from the local user;

🔵 **Note:** When returning to the main page: the number of supervisors for the local user is updated

CAREL

Procedure: assign all supervisors to a local user

1. In the "Supervisors" section, click [All]; the local user will be associated with all the supervisors (as well as the Remote users).

○ **Note:** When returning to the main page again: the number of supervisors for the local user is updated

Procedure: local user synchronisation to transfer the changes made to the local user configuration on the supervisors.
1. Press the "Synchronise" button.

○ Note:
  • the status column under Configuration -> Access represents the operation that must be performed on the local supervisor; in particular, the yellow background highlights the operations that are yet to be performed;
  • the different icons indicate that the user:

✓	Must be assigned to the local supervisor
✎	Has already been assigned to the supervisor, but needs to be updated (for example, the password has been changed)
✗	Has already been assigned to the supervisor, but needs to be updated (for example, the password has been changed)

  • if a supervisor is removed from the list of supervisors for the user, it will be marked by the ✗ icon only if it had been previously created. If the user has never been created on the supervisor by the local user management function, the item will be removed from the list directly, without making any changes on the supervisor.

3.6   Alarm configuration

Before running synchronisation with the local supervisors, the related options need to be configured. On first synchronisation, RemotePRO receives the system configuration; external alarms, events and notes that are no more than 5 days old are also downloaded.
To configure this maximum synchronisation interval and other options, go to:

Menu path: **Configuration → Administration→ System**

Fig. 3.q

Field	Description
Synchronise the connection	If the flag is enabled, RemotePRO, as well as opening the supervisor page, will also start synchronisation. Otherwise, synchronisation is only performed by the local supervisors or activated when clicking the 'Synchronise' buttons on the pages. To connect to the local supervisor web interface: access: Alarms -> Supervisor status; click [icon].
Max synch days	This limit avoids downloading old events/alarms that may slow down/stop the operation of RemotePRO.
Mandatory ACK for reset alarms	If this flag is enabled, the alarm is moved from "Active alarms" to "Reset alarms" only if the alarms have ended (there is an end alarm date) and have been "acknowledged".

Field	Description
Check notes on acknowledged alarms	If this flag is enabled, to acknowledge an alarm at least one alarm note must be entered.
Default acknowledge note (max 100 characters)	If the "Check notes on acknowledged alarms" flag is enabled, when "acknowledged" is selected from the list of "Active alarms" on one or more than one alarm WITHOUT notes, RemotePRO will create a note for each of these using the text entered here
Subject	Subject of the alarm email

○ **Note:** after having configured a local supervisor, it is preferable to run an initial synchronisation with the remote system, i.e. download the information that has been selected during configuration (e.g. alarms, events). Synchronisation with the remote supervisor can be started manually by the remote user, as described below, or can start automatically if the local supervisor has been configured to call the remote supervisor in response to an alarm or event (see the corresponding manual).

Procedure: global alarm synchronisation
The process can be activated on all supervisors
1. Select the [initial status] checkbox.
2. Click the [Synchronise] button.

3.7 Life test configuration

Periodical verification of communication between the local supervisors and the RemotePRO server.

Function	Description
Outgoing life test	RemotePRO server calls the local supervisor
Incoming life test	The local supervisor calls the RemotePRO server

◐ **Note:** see the local supervisor manual for details on configuring the call to RemotePRO.

The number of times the life test is performed each day can be configured.

Menu path: Configuration ☾ Administration ☾ System

Fig. 3.r

Field	Description		Field	Description
Outgoing/incoming via LAN	--.1 ,…12, 24 = Never,1 ….12, 24 times a day		Outgoing/incoming via modem	--.1 ,….6 = Never, 1 …6 times a day

◐ **Note:** The tests start at midnight: if 12 tests are set, the first test starts between 00:00 and 02:00, the second test between 02:00 and 04:00,…, etc.

Incoming life test
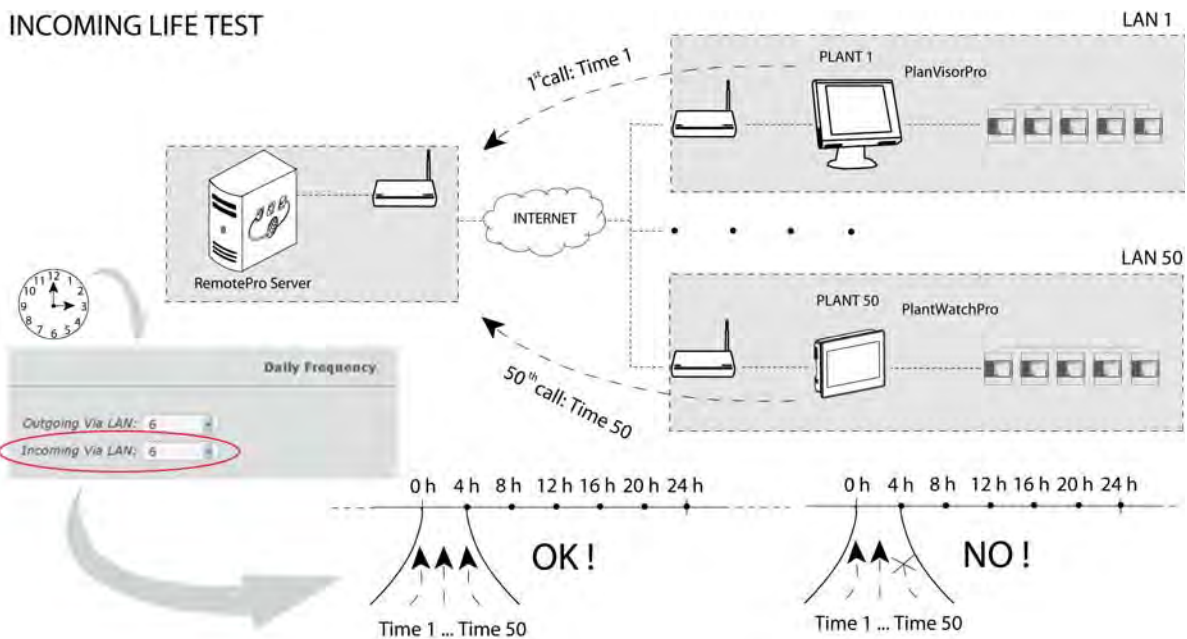
Fig. 3.s

Based on the set frequency the tests are divided across the day into the corresponding number of intervals. In the example shown, if at 3:00 a daily frequency of 6 incoming tests is set, at 4:00 RemotePRO will verify whether the calls from 50 supervisors have been received in the previous 4 hours. If no call was received or the call was delayed (after 4:00), the test is considered as having failed.

⚠ **Important:** configure the call to RemotePRO on each local supervisor!

CAREL

Outgoing life test
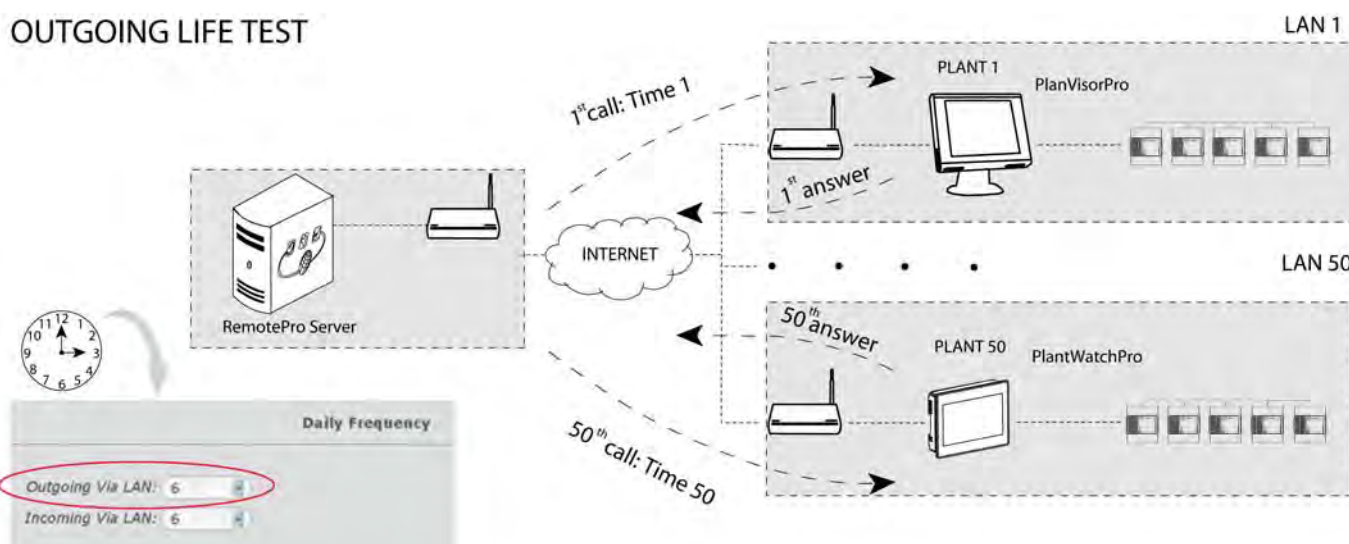
Fig. 3.t

Based on the set frequency the tests are divided across the day into the corresponding number of intervals. For example, every 4 hours RemotePRO calls the local supervisors and checks that they all respond. If a supervisor does not respond, the outgoing life test for that supervisor is considered as having failed..

Note: as communication via modem is slower, a maximum of 6 incoming/outgoing life tests can be set in this mode.

3.8   Alignment

Data alignment is a procedure that is scheduled to be performed automatically 2 to 3 times a day. The scheduled time is settable.

Note: data alignment is only performed on local supervisors that have been configured accordingly. To enable the function, set the "data" parameter on the local supervisor.

Menu path: Configuration →Administration → System
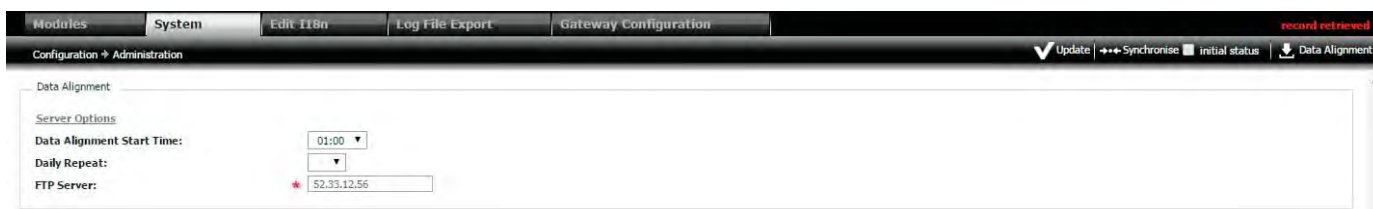
Fig. 3.u

Server options, data alignment

Field	Description
Data alignment start time	Starting time
Daily repeat	2/3

Field	Description
FTP server	For pCOWeb local supervisors: in the "FTP server" field enter the IP address of the computer that RemotePRO is running on

<u>Procedure:</u> global data alignment
The process can be activated for all supervisors

1.   Click the [Data Alignment] button.

3.9 Rules engine

To create automatic alarm notification actions, the following need to be configured:
1. **Notification group:** includes one or more contacts. The contacts that can be selected are read directly from the contacts (Configuration -> Contacts);
2. **Rules:** defines which alarms are managed;
3. **Time bands:** associates the notification group with the rules, also setting the time band in which these are enabled.

3.9.1 Notification groups

Groups to be notified of alarms by email.

Menu path: Activity ☾ Rules engine
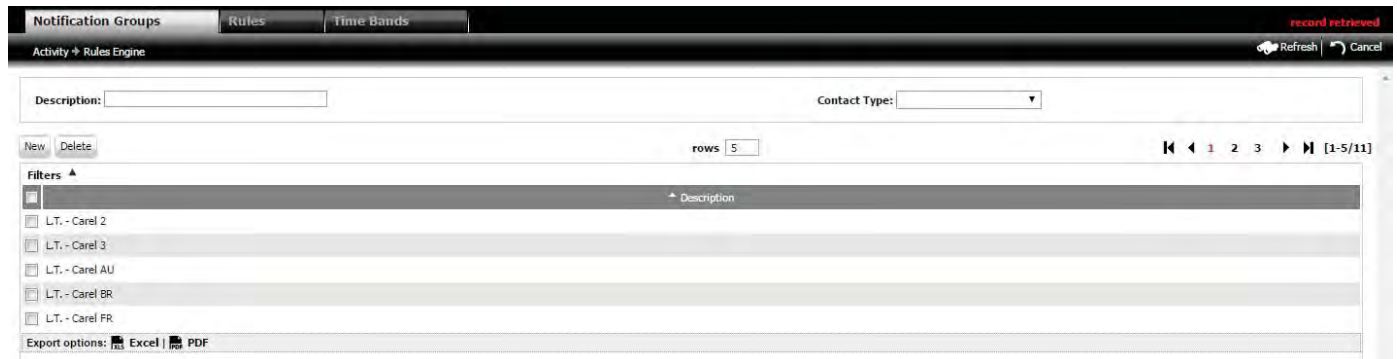
Fig. 3.v

DETAIL PAGE1

Fig. 3.w

DETAIL PAGE2
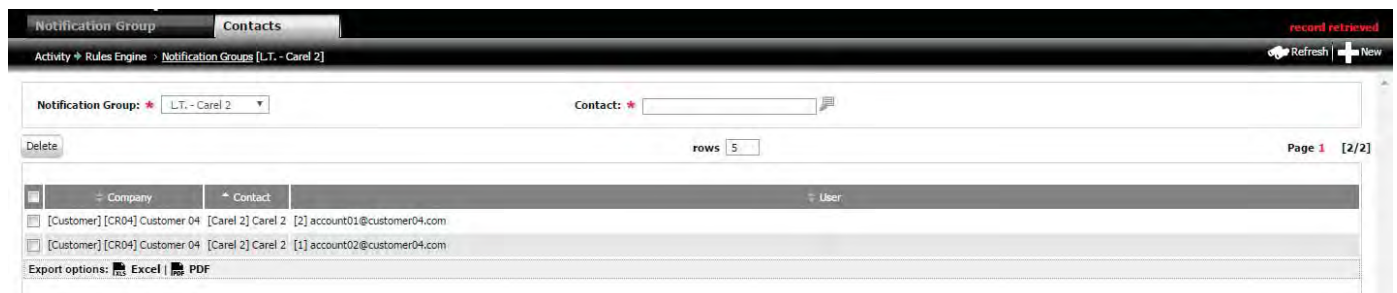
Fig. 3.x

Procedure: creating a notification group
1. Click on ▦ in main page;
2. On the secondary page 1: Enter the Description and Contact Type: Email, Fax, Cell Phone, Phone;
3. Click on ▦ to save; *"Record created"* is shown;
4. Click the navigation path to return to the main window.

➡ Note: when the procedure has been completed successfully, the message **"modified created"** is shown in the system message area.

Procedure: adding contacts to the notification group
1. Click double on the row of the notification group created: the secondary page 1 opens; Cliccare su Contacts si apre la pagina secondaria 2;
2. Click on 🗩: contact list opens;
3. Click double on the contact to be added;
4. Click on ▦ to save: the contact is added in the list.

➡ Note: when the procedure has been completed successfully, the message **"modified created"** is shown in the system message area.

3.9.2 Rules

Rules for notification of alarms by email.

Menu path: Activity ☾ Rules engine ☾ Rules
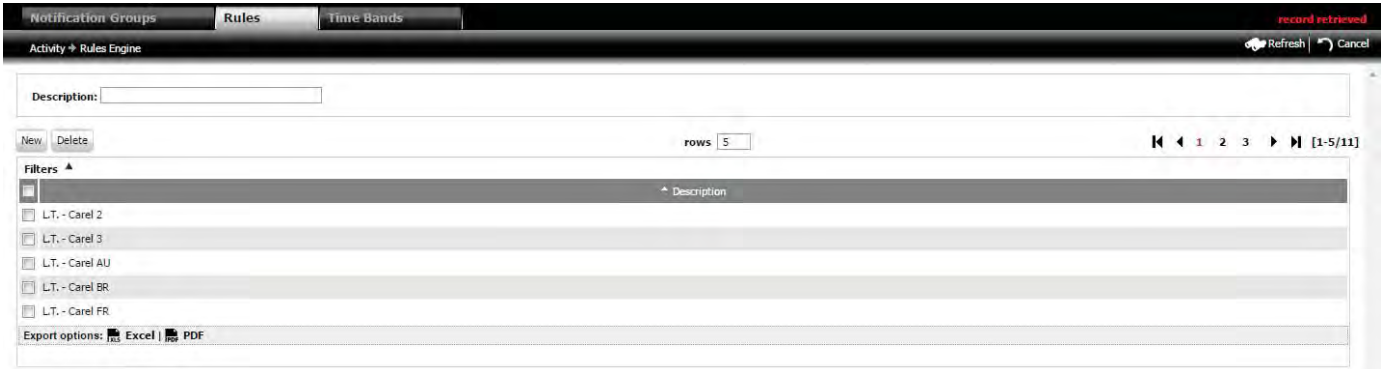
Fig. 3.y

DETAIL PAGE
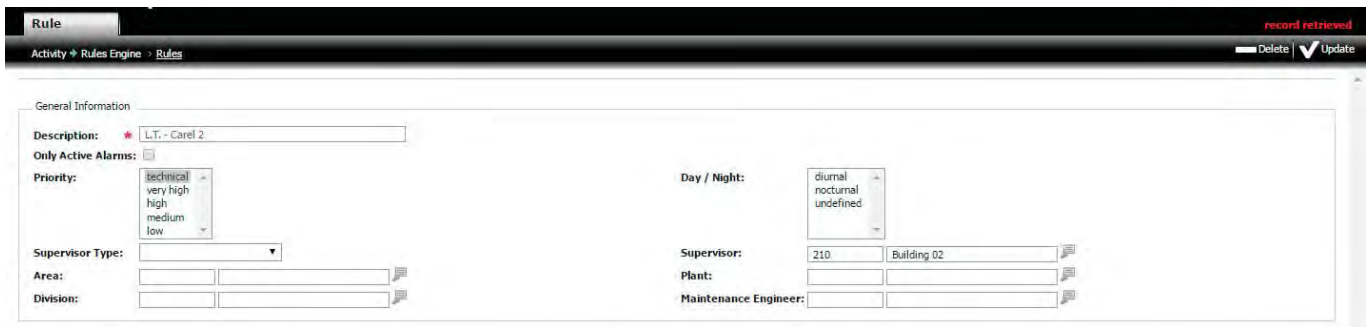
Fig. 3.z

Field	Description
Description	Name describing the rule being created
Only active alarms	Only alarm activation is notified, and not alarm reset

Field	Description	
Priority	Only alarms with the selected priority are notified. Multiple priorities can be selected. N.B.: the 'technical' priority refers, for example, to alarms signalling a failed life test, generated by RemotePRO.	Day/night Alarm notification interval: Day/night: the alarms that are activated within/outside of the set time band for each site are notified; Not defined: no filter
Supervisor type	Only alarms from the selected supervisors are notified (pCOWeb, PlantWatchPRO, PlantVisorPRO, PlantVisor Enhanced, boss)	Supervisor, Area, Plant, Customer, Maintenance Engineer Additional filters

Procedure: creating a rele

1. Click on ⊞ in main page: secondary page opens;
2. Insert filters to define the rule;
3. Click on ⊞ to save; *"Record created"* is shown;
4. Click the navigation path to return to the main page, where description of new rule is showned.

◐ **Note:** when the procedure has been completed successfully, the message **"modified modified"** is shown in the system message area.

3.9.3 Time bands

Create time bands and associate rules with the notification group.

Menu path: Activity → Rules engine →Time bands

Fig. 3.aa

DETAIL PAGE1

Fig. 3.ab

DETAIL PAGE2
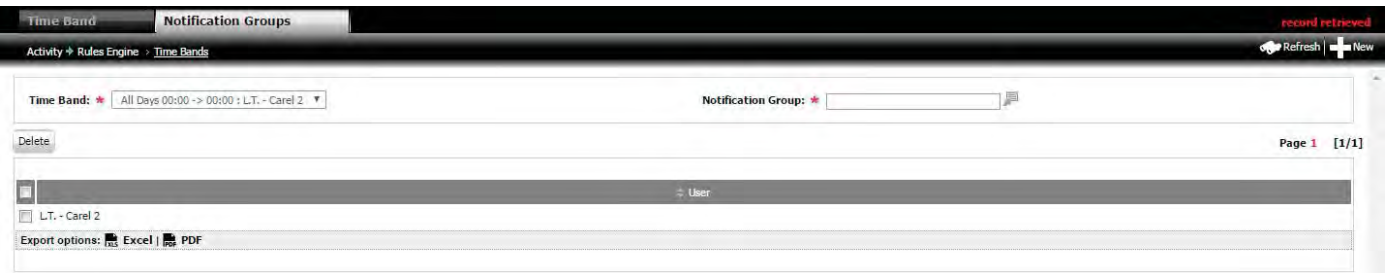
Fig. 3.ac

Procedure: creating a time band
1. Select rule-check box, day of the week and click on "New" in the main page; secondary page 1 opens;
2. Insert field of secondary page: start, end, day and associated-rule;
3. Click on ⊞ to save; *"Record created"* showns;
4. Click on "tab" to open window-page2
5. Insert notification group and click on ⊞ to save.

⬤ **Note:** when the procedure has been completed successfully, the message **"modified modified"** is shown in the system message area.

4. ALARM MANAGEMENT

Alarms received by the supervisory system can be managed based on:
• supervisor status;
• the list of alarms on the entire system (or the part visible to the user).
• geolocation map of the plants.

The operations that can be performed from the local supervisor on an alarm, and that are also visible on RemotePRO, are:
• acknowledge: the alarm is marked as checked;
• cancel: if a delay is set between alarm activation and when action is required on the supervisor (e.g. notification, action on a relay, action on a parameter), the alarm is cancelled, i.e. the system does not perform the specified operations even the alarm remains active;
• reset: the local supervisor ignores the alarm in progress. If the alarm is reset and then occurs again, it is subsequently managed.

Active alarms are all the alarms sent from a local supervisor that have not been acknowledged on RemotePRO, or that have not yet been reset on the local supervisor. These are easily recognised as there is no end alarm date. These alarms can be acknowledged for subsequent management (ACK = acknowledgement). This operation has no effect on the alarm's status on the local supervisor.

Reset alarms are alarms that have ended on the local supervisor and have been acknowledged (ACK) on the remote supervisor.

Note: a reset alarm on the local supervisor is automatically reset on RemotePRO based on the setting of "Mandatory ACK for Reset Alarms" under "Configuration -> Administration -> System".

4.1 Supervisor status

Supervisor status gives an overview of all the sites via the information provided: icons relating to the 'life test' and 'status', columns indicating the date of last synchronisation and data alignment.

Menu path: Alarms ☽ Supervisor status

Fig. 4.a

Field	Description		
L.T. (Life Test)	Outcome of the incoming and outgoing life tests		
	LED	**MEANING**	
	Red	At least 1 test has failed	
	Green	Both tests passed	
	Orange	Test scheduled but not active	
	Grey	Test not scheduled	
Status	Alarms on the supervisor:		
	LED	**MEANING**	
	Red	Active alarms	
	Green	No active alarms	
Client	Customer that owns/operates the site		
Plant	Site where the supervisor is installed		
Supervisor	Local supervisor		

Field	Description
Type	Icon that identifies the type of supervisor (boss, PlantWatchPRO, PlantVisorPRO, PlantVisorEnhanced, pCOWeb, …)
Connection	Buttons for connecting to the supervisor's web interface
Last synchro	Date and time of last synchronisation
Last alignment	Date and time of last data alignment

Note: where configured, the connection button allows "auto-login" on the supervisor, a function that makes operations faster for the user. For further information see the paragraph corresponding to local users.

4.2 Management of alarms, devices, notes and events on the local supervisor

From the previous page, double clicking a row corresponding to a supervisor opens the detail page that shows the main information on the supervisor. The first tab provides an overview on the status of the controllers (the devices with alarms are shown at the top of the list). The other tabs are used to view active alarms, reset alarms, local events and local notes.

Menu path: Alarms ☾ Supervisor status ☾ Double click the selected supervisor

4.2.1 Supervisor
Page showing an overview of the status of the devices connected to the supervisor.
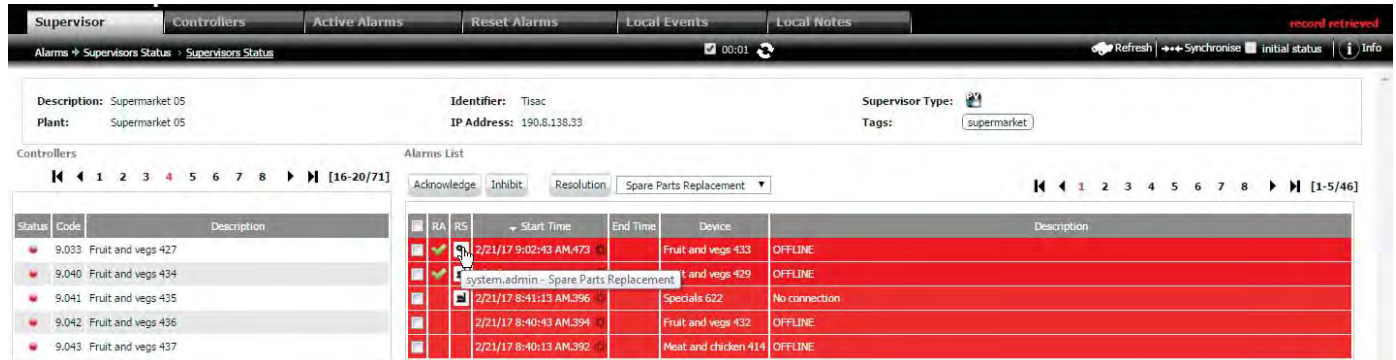
Fig. 4.b

Field	Description
Description	Supervisor description
Supervisor type	-
IP address	IP address
Status	Alarms on the device:

LED	MEANING
Red	Active alarms
Green	No active alarms

Field	Description
RA	Acknowledged alarm (ACK)

| Start time | Alarm start date/time on local supervisor. Icons ❄ and ☀ indicate if alarm is occured during opening hours of plant (day) o during the closing (night). See the plant configuration |
| Device | Description of the device |

Field	Description
Identifier	Supervisor identifier
Plant	Site where the supervisor is installed
Tag	Device tag (see Configuration -> Plant)
Code/ Description	Code: device code sent by the local supervisor. Description: description of the device

| RS (RS) | How the alarm was resolved: |

Type of response	Icon	Type of response	Icon
No operation		Remote maintenance	
On-site maintenance		Replace parts	

| End time | Alarm end date/time on local supervisor |
| Description | Description of the alarm |

Note: the tooltip shown when moving the mouse pointer over the RA and RS columns indicates:
- in the RA column: the user that acknowledged the alarm;
- in the RS column: the user that resolved the alarm and how it was resolved.

Procedure: Acknowledge
the alarm is displayed with a check sign;
1. select the desired rows using the corresponding checkboxes ☐
2. click the Acknowledge button
3. click "OK" in the confirmation pop-up

Note: when the procedure has been completed successfully, the message **"modified modified"** is shown in the system message area.

Some alarms may be shown as active on RemotePRO even if they have been reset on the local supervisor. This may occur, for example, if a local supervisor remains offline (not accessible) for a time exceeding the "max synch days". Active alarms on RemotePRO that are reset on the local supervisor during this period cannot be synchronised, and therefore remain active on RemotePRO. In such situations of inconsistency the alarms cannot be forcibly reset.

Procedure: Inhibit alarms
1. select the desired rows using the corresponding checkboxe ☐
2. click the Inhibit button
3. click "OK" in the confirmation pop-up

Note: when the procedure has been completed successfully, the message **"modified modified"** is shown in the system message area.

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Procedure: assign alarm response

1. select the desired rows using the corresponding checkboxes ☐;
2. Select from the drop-down menu for the made-resolution;
3. click the [Resolution] button.

The alarms are highlighted by different colours based on their priority. When an alarm has an end alarm date or has been acknowledged on the remote supervisor, it is highlighted in the same colour, only darker.

Active alarm	Reset alarm	Priority
		Technical alarm (e.g. local supervisor offline)
		Very high
		High
		Medium
		Low

4.2.2 Controllers

List of devices connected to the supervisor

Fig. 4.c

Field	Description
Code/Description	Code / description of the device
With alarms	-
Tags	-
Status	See explanation on the previous page
Address	-
Device model	-

Field	Description
Address	Device serial address (depends on the protocol)
Device model	-
Code	-
Description	-
Tags	-

4.2.3 Active alarms

List of active alarms on the supervisor
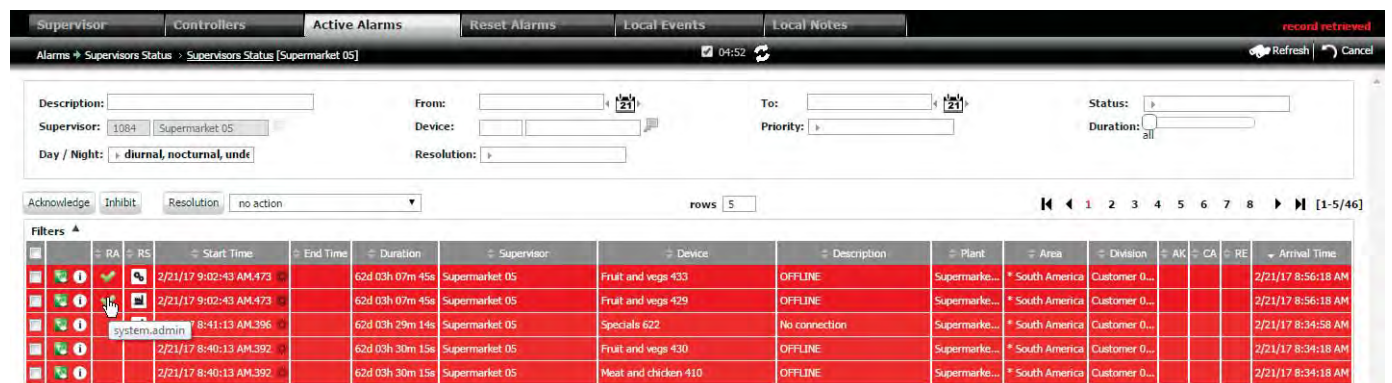
Fig. 4.d

Field	Description
Description	Alarm description
Status	acknowledged from remote, acknowledged, viewed, reset, cancelled, inhibited, not inhibited
Device	-
Duration	Alarm duration filtering options: 30 min, 1 hour, 2 hours, 3 hours, 4 hours, 6 hours, 8 hours, 12 hours
Resolution	See the previous page

Field	Description
From/to	Alarm interval start/end date
Supervisor	Supervisor filtering options
Priority	See the previous explanation
Day/night	Alarm activated during the day, night, not defined

Field	Description		Field	Description
Green icon	Button for connecting to the supervisor's web interface		Info	The info shown here relates to the alarm (notes relating to the supervisor, site, customer, maintenance operators entered in the contacts, comments, documents)
RA	Acknowledged alarm (ACK)		RS	How the alarm was resolved: no operation, on-site maintenance, remote maintenance, replace parts
Start time	Alarm start date/time on local supervisor		End time	Alarm end date/time on local supervisor
Duration	Difference between current date/time and alarm start date/time		Supervisor/device	-
Description	Alarm description		Plant/Area	Site/area where the alarm occurred
Client	Customer relating to site with alarm		AK	Acknowledged
CA	Cancelled		RE	Reset
Arrival time	Time the alarm was received on RemotePRO			

The operations that can be performed by RemotePRO are the same as those available on the Supervisor page.

4.2.4 Reset alarms

List of reset alarms on the supervisor.

Fig. 4.e

See the table corresponding to "Active alarms". The final item, "Inhibited", indicates whether the alarm has been inhibited.

4.2.5 Local events

List of the local events on the supervisor received during synchronisation

Fig. 4.f

Field	Description		Field	Description
Date and time	Date and time when the event occurred on the local supervisor		Type	See the explanation below
User	-		Category	Category of the action (see local sup.)
Description	Description of the action			

There are three types of local events on the local supervisor (select the corresponding checkbox to filter the data)

	Info	Information relating to correct system operation
	Warning	Highlights configuration problems
	Error	Highlights problems that prevent system operation

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4.2.6 Local notes

List of notes from the local supervisor received by RemotePRO during synchronisation

Fig. 4.g

Field	Description	Field	Description
Entry time from/to	Time interval to filter notes	User note	User who entered the note
Last update from/to	Update interval to filter notes	Notes	-

4.3 Device detail

Menu path: Alarms ☾ Supervisor status ☾ Double click the selected supervisor ☾ Double click the device

Double clicking a device opens the detail page. The second tab, "Log Data Graphs", shows graphs with the values of the device's logged variables (analogue and digital). The graph is displayed at the top, while at the bottom is the list of the variables that can be displayed on the graph, selecting these and choosing the corresponding colour (the default colour is defined by the model).

Fig. 4.h

PERIOD SELECTION

From	Date of the reference day for the data shown on the graph
Period	Time interval of the data: • daily: data corresponding to the set day • weekly: data corresponding to one week starting from the set day • monthly: data corresponding a one month starting from the set day

➲ **Note:** the mouse can be used to zoom the graph: the minimum interval displayed is 1 hour.

Fig. 4.i

Field	Description	Field	Description
Displays	Checkboxes: select the variables to be displayed on the graph	Device (controller)	Description (name) of the controller
Description	Description (name) of the monitored variable	Colour	Click the squares to select the colour that the variable will have on the graph
Minimum value	Minimum value measured in the selected period	Maximum value	Maximum value measured in the selected period
Model	Indicates whether on the controller model the variable is selected to be displayed on the graph by default	Saved	Indicates whether the variable is logged on RemotePRO

Procedures:
1. Import from model: used to restore the selections and colours to the default values for the device model;
2. Update model: used to set the current configuration as the default for the current controller model

➲ **Note:** if no values are shown for a variable on the graph make sure the variable is checked as logged in the corresponding column.

➲ **Note:** the available variables are those aligned with the Local Supervisor.

4.4 Alarm list

This menu shows the list of all alarms present (not divided by supervisor, as in **Alarms → Supervisor status**)
The acknowledge, inhibit and resolution operations already described can also be performed from the "Alarms list" menu. See paragraph "Display alarms, devices, notes and events"

Menu path: **Alarms → Alarms list**

Fig. 4.j

See the table corresponding to the active alarms for the description of the fields.
For the procedures, see paragraph "Alarm management".

4.5 Alarm details, acknowledge, inhibit and resolve

Menu path: **Alarms → Alarms list → Double click to open the details**

Fig. 4.k

ACKNOWLEDGE, INHIBIT AND RESOLVE AN INDIVIDUAL ALARM
The procedure to acknowledge, inhibit and resolve the alarms are similar to those described in the previous paragraphs. The "Connection" button is the same as the green button for connecting to the supervisor's web interface. In addition, clicking the "graph" button directly opens the graph of device variables logged when the alarm occurred.

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4.6 Geolocation

It is possible to view the implants on a geographic map.
The function is available if you are connected to the Internet.

Fig. 4.l
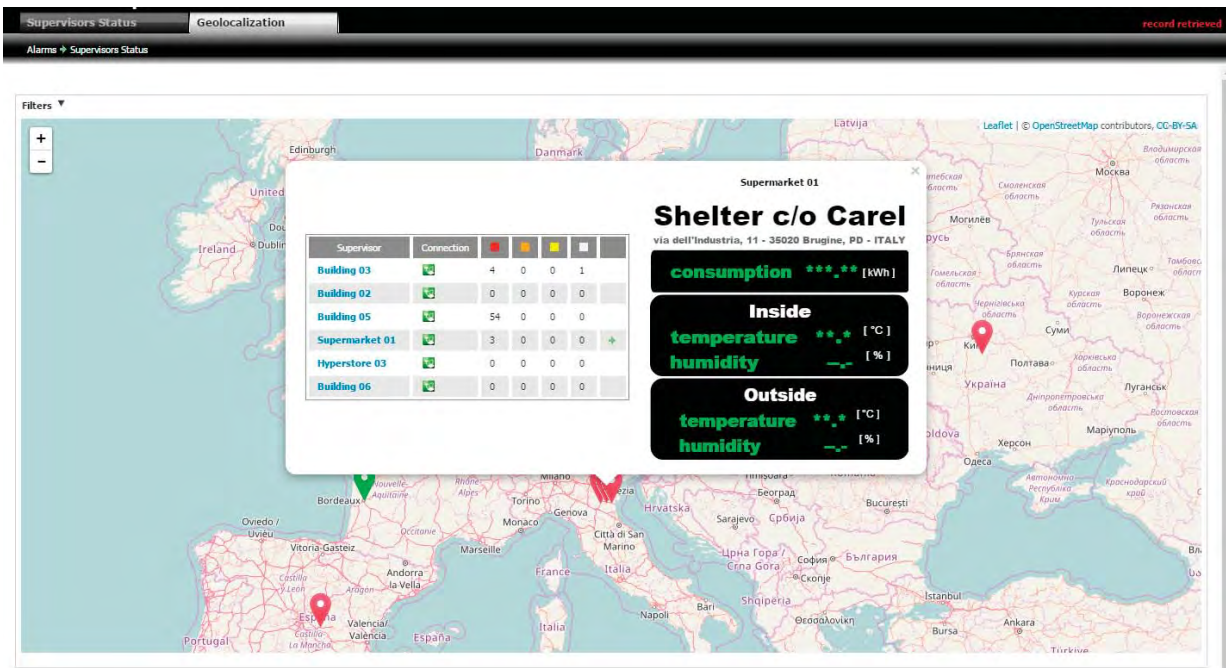
5. ALARM KPIs

The alarm KPIs are used to carry out comparative analysis on active and reset alarms.

5.1 Priority synoptic

This offers a graphic representation of alarm distribution by priority. Consequently, site performance can be evaluated.

Menu path: Alarms ☾ Priority synoptic
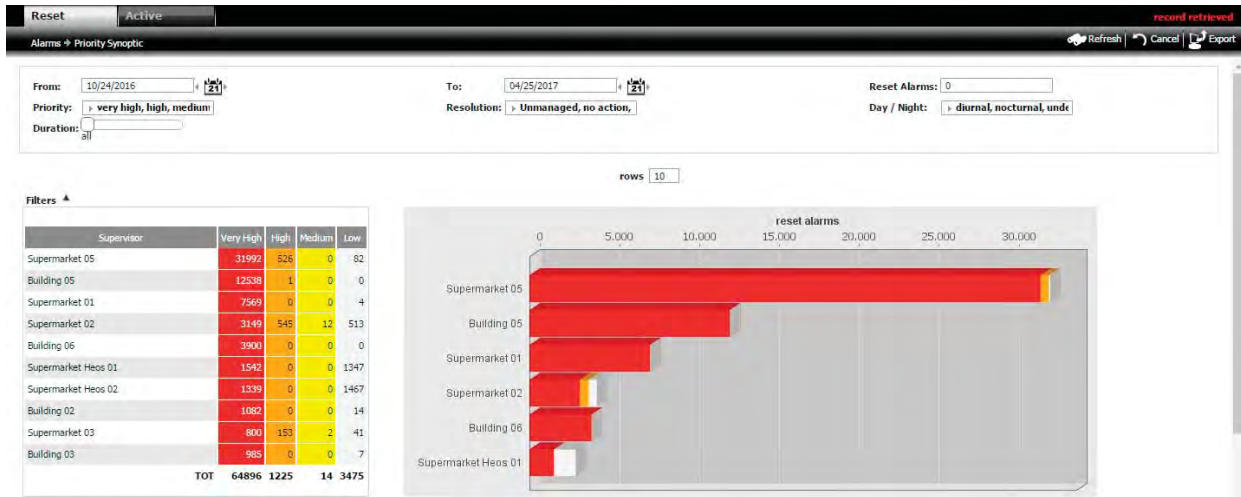
Fig. 5.a

Note: the number entered in the "Reset alarms" filter field represents the minimum number of alarms to be displayed for each supervisor (if the supervisor has a lower number of alarms, this is ignored).

Alarm analysis is distributed by supervisor. To examine the analysis in detail, simply click a bar on the graph or double click a row in the table to open the detailed analysis of the devices that belong to the selected supervisor.
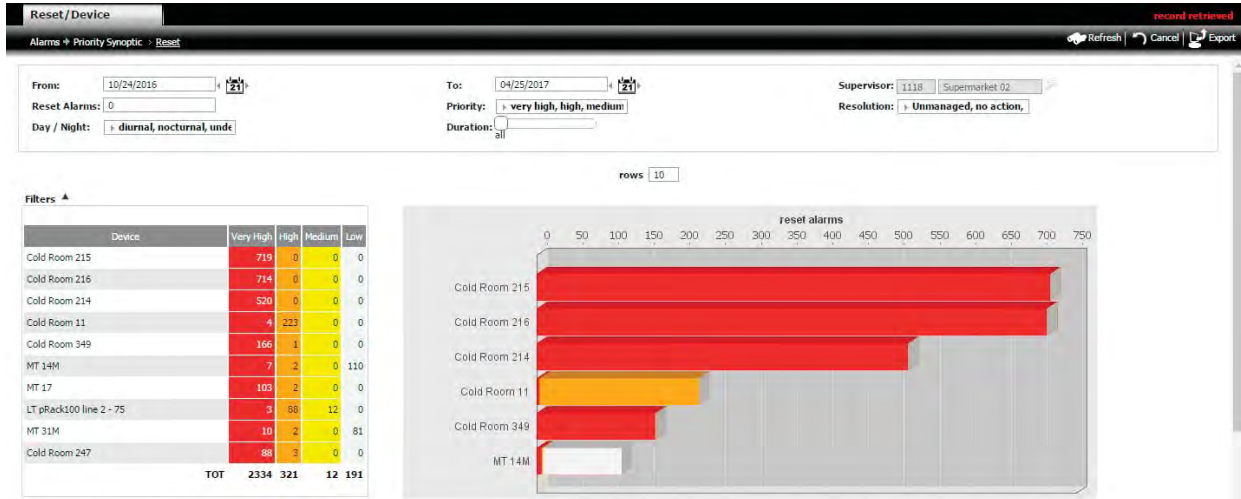
Fig. 5.b

The list of alarms pertaining to a device can be accessed by selecting an element on the graph or the table.

Fig. 5.c

CAREL
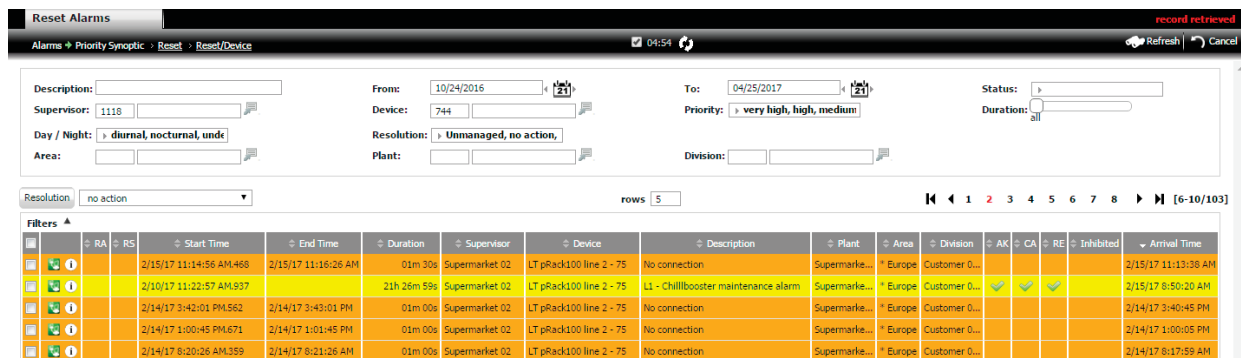
5.2   Maintenance rating

This is used to evaluate maintenance performed on the sites by analysing the alarms. For example, based on the Service Level Agreement (SLA), the system can compare the performance of maintenance companies.

Analysis by resolution
Displays the distribution of maintenance on the supervisors, divided by alarm resolution:
• not managed;
• resolved with no action;
• resolved with on-site maintenance;
• resolved with remote maintenance;
• resolved with replacement of parts in the Field.

Menu path: Alarms ☾ Maintenance rating
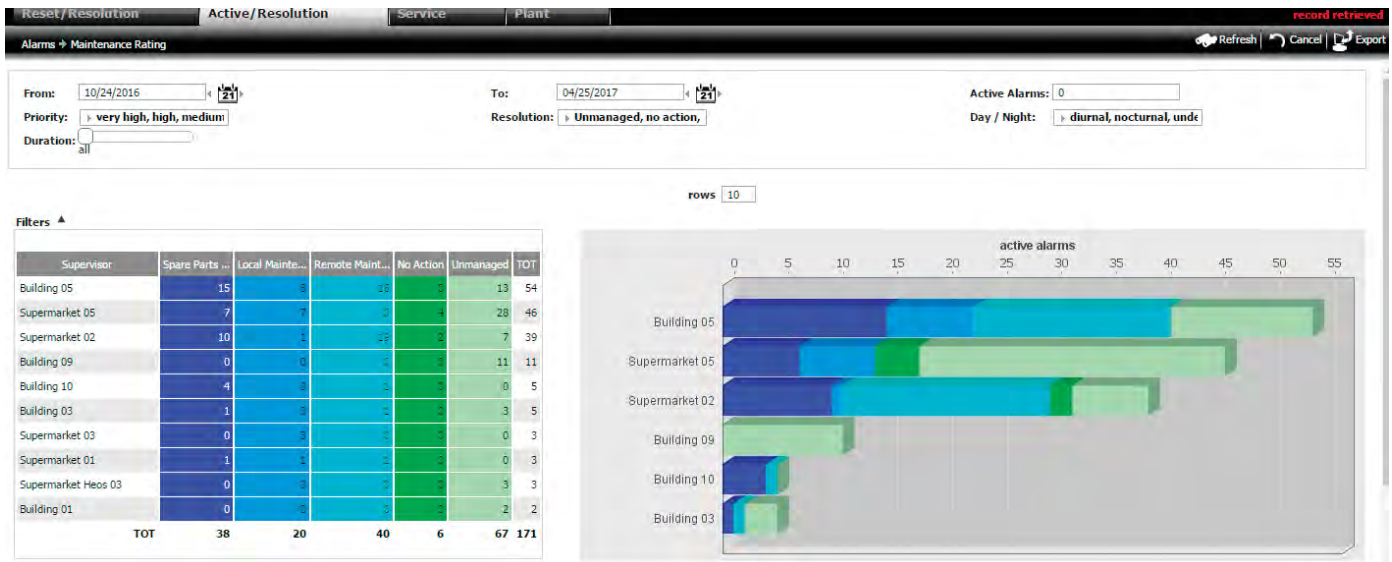
Fig. 5.d

Note: in the previous table, the colours define the operations based on cost:
• blue (various shades): operations with a cost in terms of time or money;
• green (various shades): no cost.

To access the details for a supervisor, click a bar on the graph or double click a row in the table.
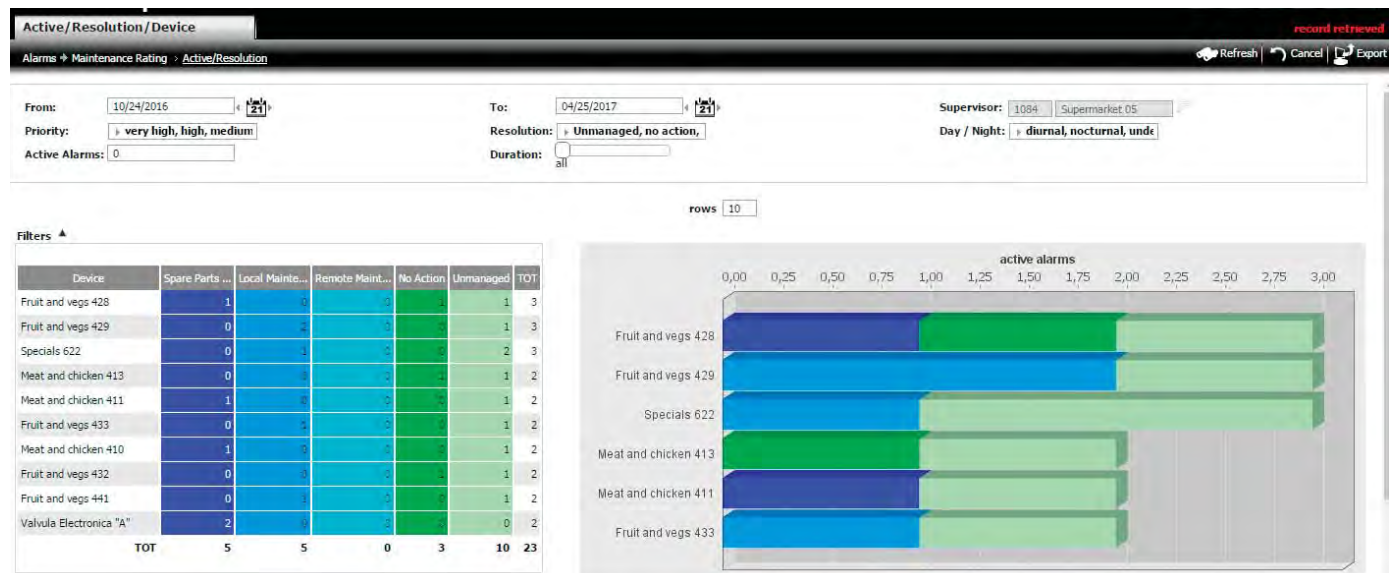
Fig. 5.e

Analysis by service company
Displays the distribution of maintenance performance on the supervisors, divided by service company.
The following can be analysed for each company:
• the number of alarms, divided by priority;
• the percentage of alarms not resolved in accordance with the SLA (Service Level Agreement);
• the number resolved by inhibiting.

Menu path: Alarms ☾ Maintenance rating
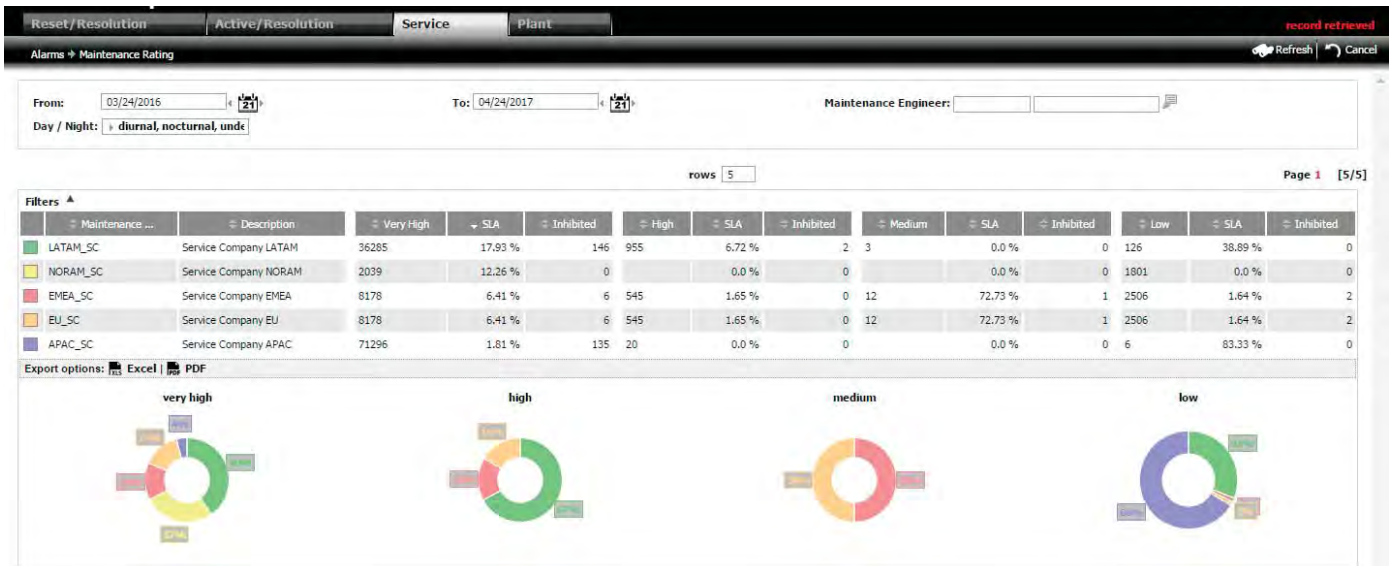
Fig. 5.f

To analyse the sites pertaining to a service company in detail, double click the row in the list of service companies.
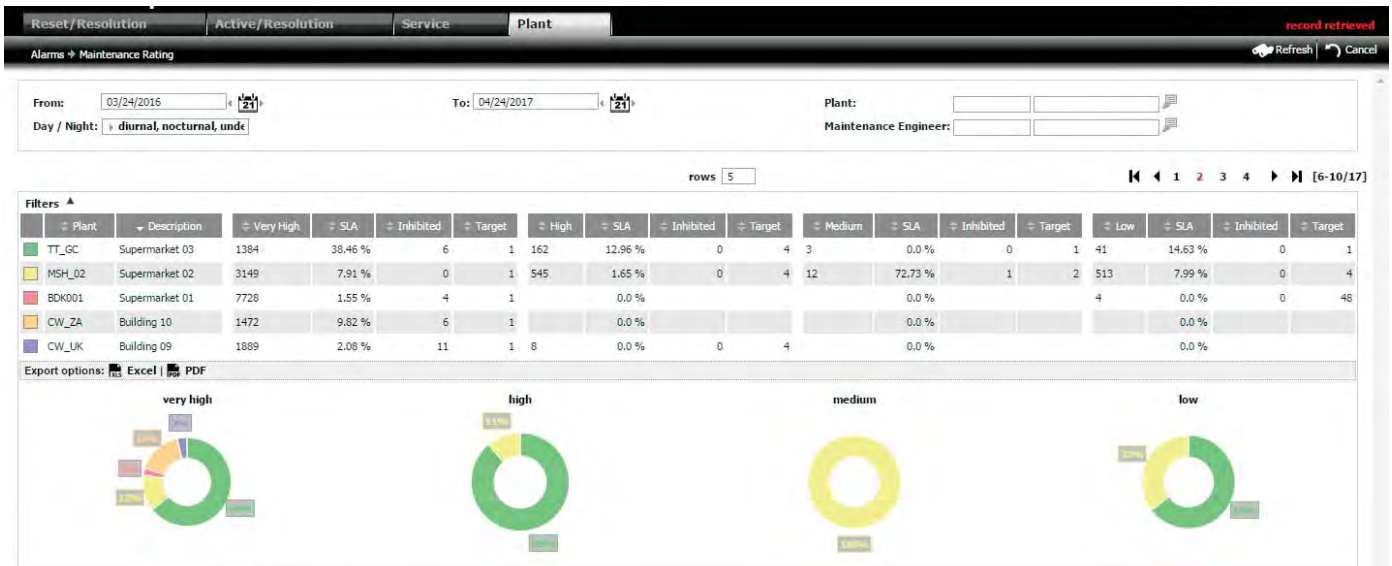
Fig. 5.g

➲ **Note:** the Service Level Agreement (SLA) classification is set on the "Plants" page (Configuration -> Installation -> Plants).

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6. USAGE KPIs

The KPIs (Key Performance Indices) relating to electricity, gas and water usage are used to make a comparison between sites or between performance of the same site over different time intervals, for example to:

1. identify short-term energy expense factors;
2. monitor improvements based on previously adopted energy saving measures;
3. implement suitable measures and define potential investments.

To compare different types of sites, a normalisation factor is used (this can be configured in the field "Label of normalised value" in: **Usage → Detail →** (tab) KPI Configuration. In the case of a hotel, if each floor is managed by a supervisor and the total hotel surface area exceeds the sum of areas assigned to each supervisor, this fact can be taken into account to compare situations that are not equivalent.
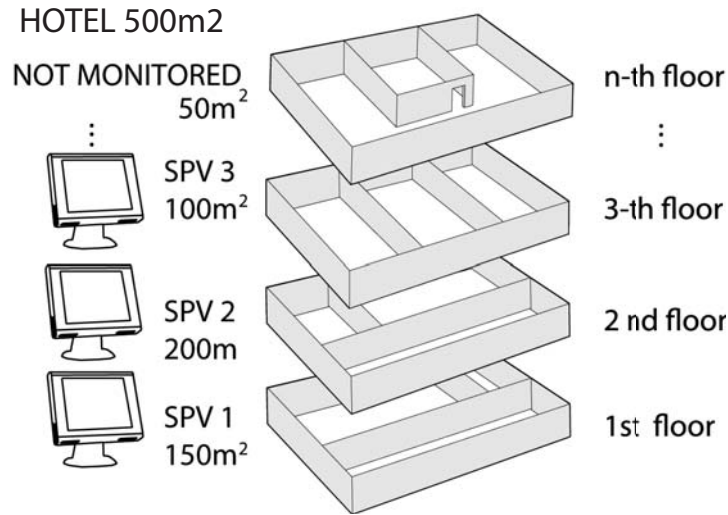
Fig. 6.a

⬤ **Note:** other examples of normalisation factors include store opening hours, the number of visitors or a coefficient that takes account of different environmental parameters.

6.1 Site configurations

Page for entering the total normalisation factor for the site.

Menu path: Usage ☾ Configuration ☾ Plants

Fig. 6.b

⬤ **Note:** the data in field (3) "Sum of supervisors" is shown after entering the areas assigned to each supervisor on the following page.

6.2 Supervisor configuration

Page for entering the normalisation factor assigned to each supervisor.

Menu path: Usage ☾ Configuration ☾ Supervisor
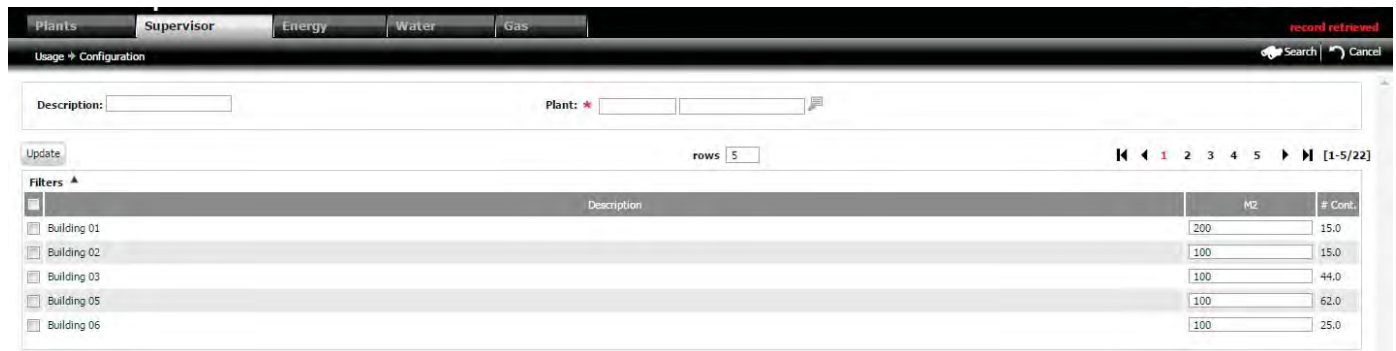
Fig. 6.c

Note: field (3) shows the number of controllers connected to the supervisor.

6.3 Energy meter network layout

6.3.1 Energy meter hierarchy

There are three types of energy meters:
- global: measure the power consumption of just one refrigeration unit or a group of partial meters, each relating to a sub-group of refrigeration units on the site;
- partial: measure the power consumption of a sub-group of refrigeration units;
- disabled: ignored by RemotePRO for calculating energy consumption.

Example:
RemotePRO measures the energy consumption of a system monitored by PlantVisorPRO.
The system includes:
1. a cold room, with power consumption measured by emeter1;
2. six cabinets, divided into groups A, B, C, whose power consumption values are measured respectively by emeter3, emeter5, emeter6. emeter4 is used to measure the total power consumption of groups B+C+D, however its value is ignored for the total calculation, as this is already used by the global emeter2.

As well as the cold room, with a cooling capacity of 100 kW, there is a number of cabinets, each with a capacity of 10 kW:
- 1 cabinet in group A for dairy (identified in the tag column in the following screen as "dairy");
- 2 cabinets in group B, for vegetables (tag = vegetables);
- 3 cabinets in group C, for meat (tag = meat);
- 3 lights in group D.

Note: with this configuration, power consumption of the lights in group D is only measured by emeter4 and is shown in the "other" column (=global usage – partial usage) in the "benchmark" report. See the corresponding paragraph.
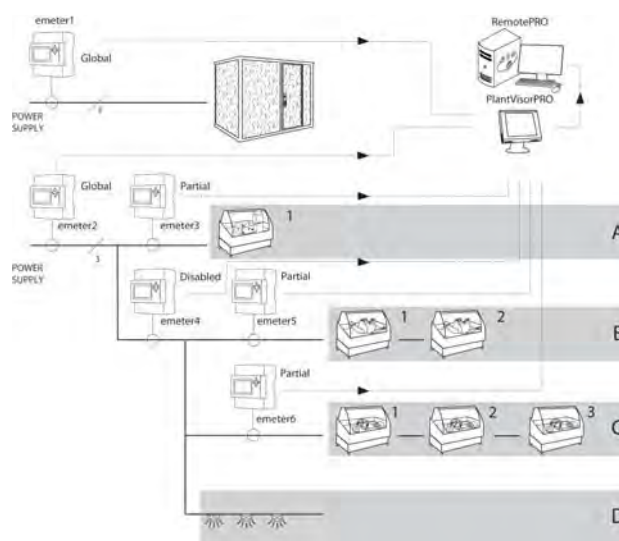
Fig. 6.d

The page shown below is used to set the network of meters as in the previous example. The Subdevice field shows the names of the meters, emeter1,…, emeter6.

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Menu path: Usage ☽ Configuration ☽ Energy (Water, Gas)

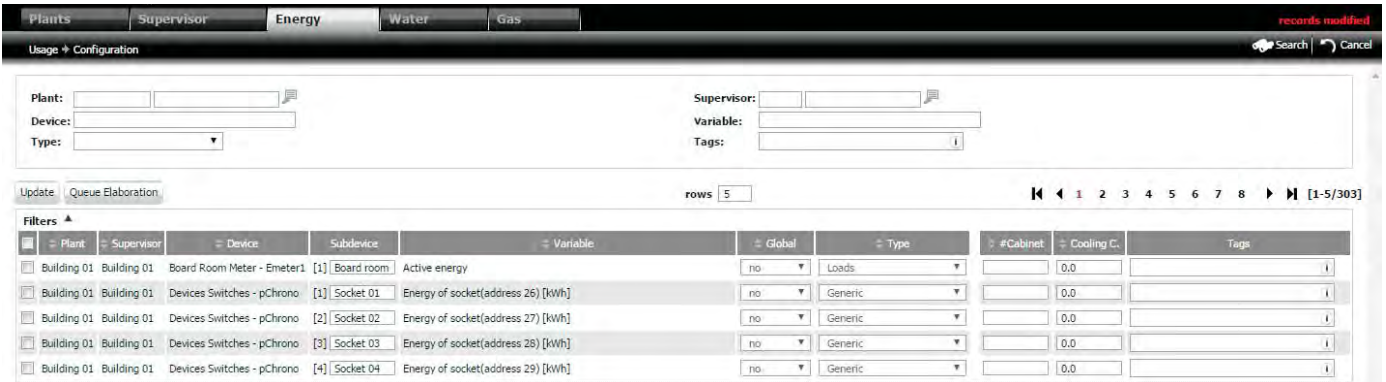Fig. 6.e

Field	Description	Field	Description
Plant	Reference site	Global: yes, disabled, no	Yes = global meter Disabled = meter ignored by RemotePRO No = partial meter
Supervisor	Reference supervisor	Type of load: • refrigeration; • medium temperature compressor rack (MT); • low temperature refrigeration (LT); • low temperature compressor rack (LT); • medium temperature refrigeration (MT); • air-conditioning • lights • loads • generic	
Device	Name of the device	# cabinets	Number of units relating to the measurement
Subdevice	Additional description	Cooling capacity	-
Variable	Variable measured and sent to the supervisor	Tags	Label available for entry by the user for filtering

Menu path: Consumi ☽ Configuration ☽ Water Gas
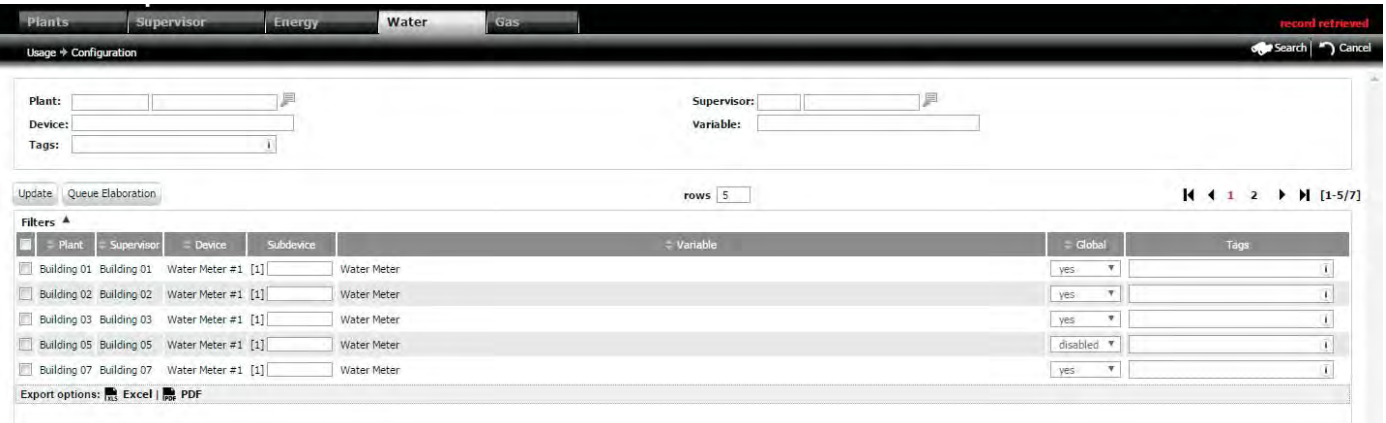
Fig. 6.f
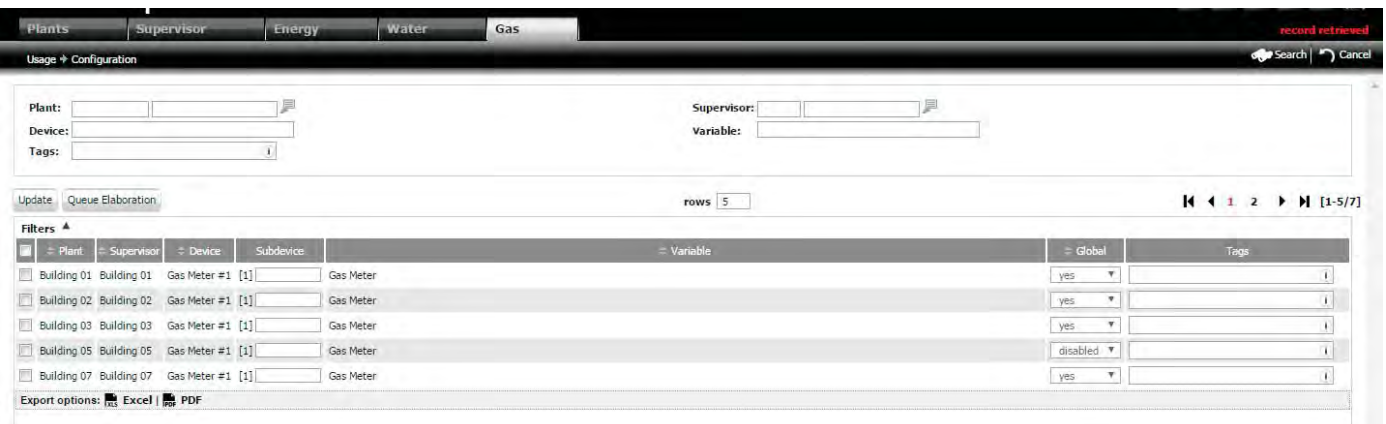
Fig. 6.g

➡ **Note:** the subdevice field is used to assign an identifier in the case where different variables on the same controller are associated with multiple devices (for example, when pCOWeb is installed on a controller such as the CAREL pChrono, each variable represents the energy read by a meter, identified in the subdevice field).

6.3.2   Change meter network layout

It may be necessary change the layout of the network of meters, for example in the event of:
- incorrect configuration;
- data logging that started before the network was configured.

The problem thus arises of interpreting the data measured by the energy meters before and after the changes. To reprocess all of the logged data based on the new layout, click "queue".

⊙ **Note:** in this case, the old data will be overwritten. if the "queue" function is not used, the past data is maintained and RemotePRO begins the new calculation using the new configuration set when selecting "Update".

6.4   Usage detail

The reports are based on the energy information acquired from the field, and are used to classify the sites with highest energy consumption.

6.4.1   Create KPI templates

KPI templates define what data is included in the reports.

Menu path: Usage ☾ Detail ☾ Template KPI

Fig. 6.h

DETAIL PAGE
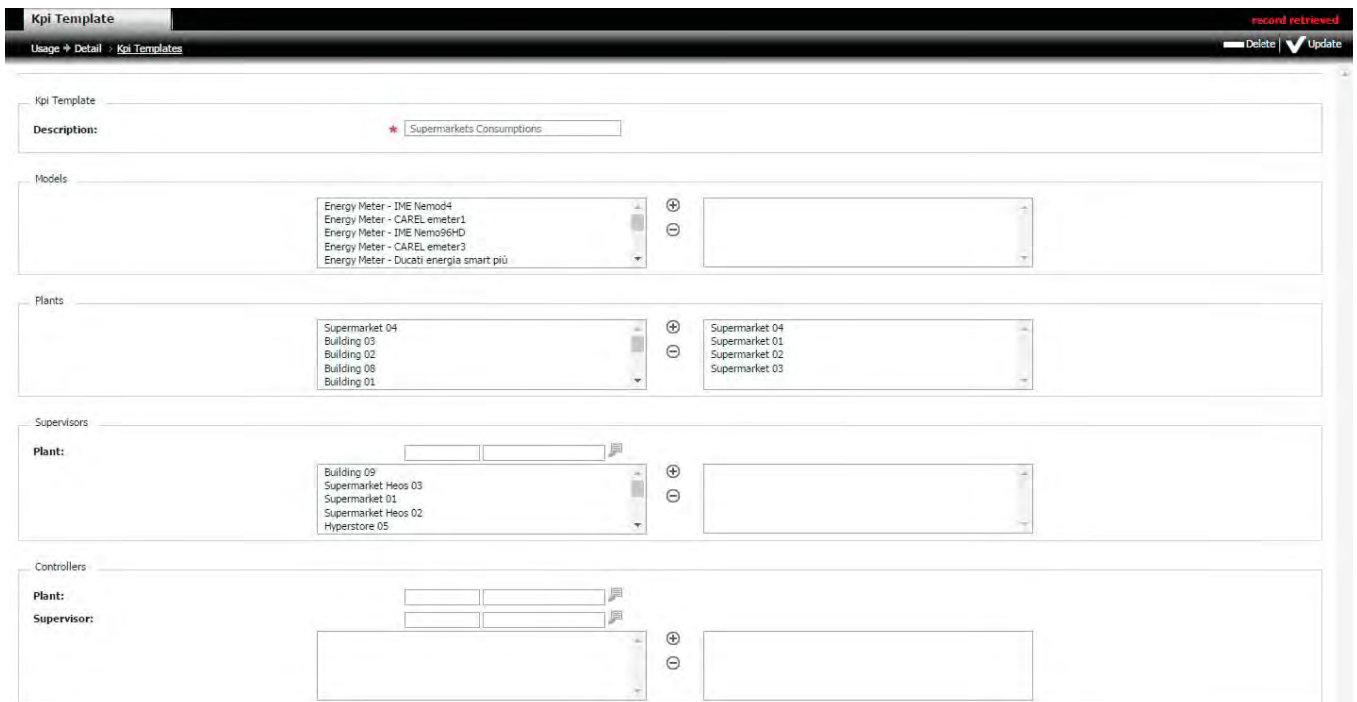
Fig. 6.i

Procedure: create KPI template
1. click New (1) on the main page: the secondary page will be displayed;
2. enter (4) the description (name) of the new report.

Use the mouse to select the rows in the window on the left, and then use ○ (⊖) to add (remove) them to (from) the window on the right.
The data contained in the reports can be selected based on:
  a. the model (5) of energy meter;
  b. the site (6) to acquire the data from;
  c. the controller that is shown after having entered the site (8) and the corresponding supervisor (9).

⊙ **Note:** the data shown in the reports are filtered based on all the filters (logical AND). A new report template can only be saved if at least one window on the right is populated with data.

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6.4.2 Set report colours/normalisation factor label

The background and text colours of the results shown in the reports can be set as desired.

Default settings

Maximum value	Red		Average value	Yellow		Minimum value	Green
Over the average value	Orange		Under the average value	Light green			

Menu path: Usage ☾ Detail ☾ KPI Configuration
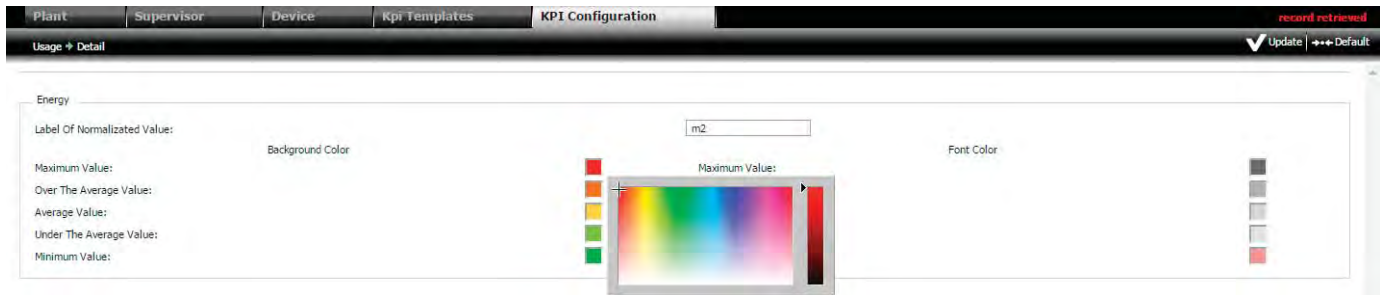
Fig. 6.j

Procedura 1: set report colours
1. Click the coloured square (e.g. red): use the cross-shaped cursor on the palette to select the new colour;
2. Click "Update" to save..

Procedura 2: set normalisation factor label
1. Enter the normalisation factor label in the field;
2. Click "Update" to save.

➡ **Note:** the label will be shown on the following pages: Usage ➔ Configuration ➔ Plants/Supervisors

6.4.3 Usage detail by site, supervisor

The reports are used to classify the sites in order of decreasing usage.

➡ **Note:** the usage values can be shown by site or by supervisor, as there may be multiple supervisors on the same site.

Menu path: Usage ☾ Detail ☾ Plant, Supervisor

Fig. 6.k

Field	Description		Field	Description
Plant	Reference site		N. Value (kWh)	Normalised value (kWh)
Value (kWh)	Energy consumption		%	Normalised energy consumption as a %
%	Energy consumption as a %		# Cont.	Number of meters
M2	Normalisation factor		Norm. val.	Normalised value (energy per meter)

Procedure: detailed usage report
1. Click (1) and select the report template;
2. In (2) select the start analysis date and the interval from the start analysis date: 1 day, 1 week, 1 month, 1 year;
3. Click "Search" to generate the report.

6.4.4   Usage detail by device

This report displays site usage divided by device (energy meter). The data corresponding to each energy meter are sorted in decreasing order and divided by the number of controllers, so as to estimate the average energy consumption per unit.
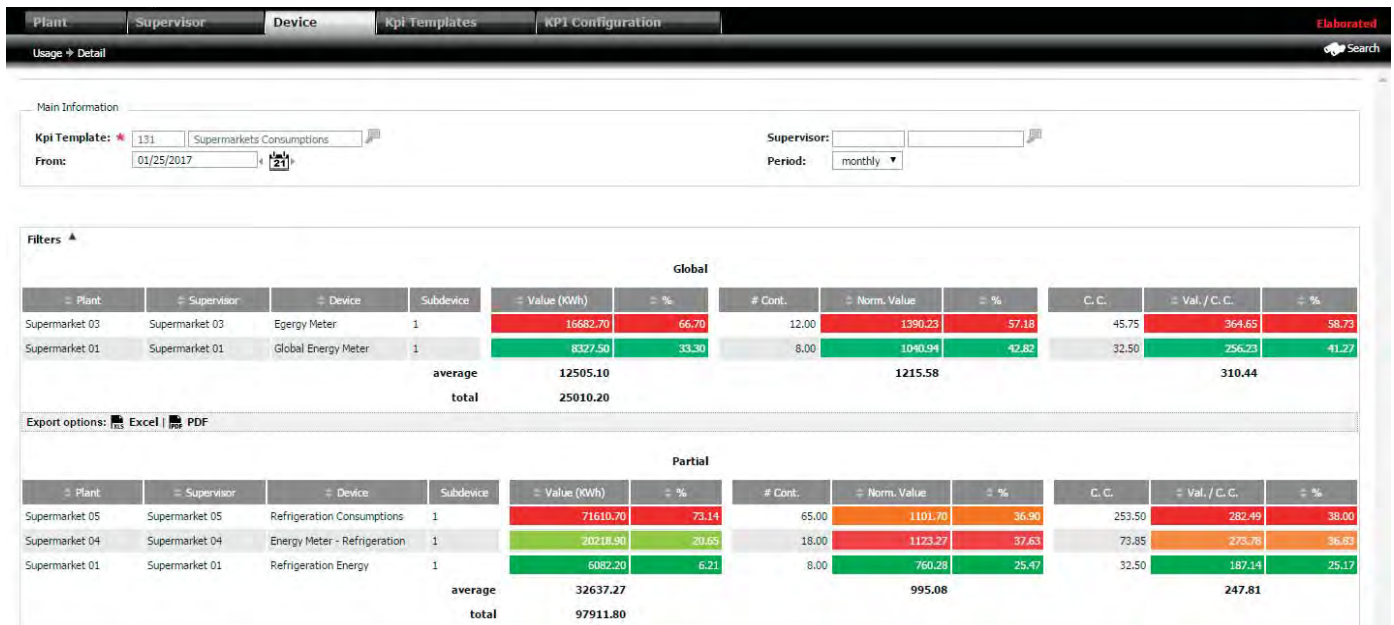
Menu path: Usage → Detail → Device

Fig. 6.l

Field	Description
Plant	Reference site
Supervisor	Reference supervisor
Device	Reference device
Subdevice	Number of sub-devices

Field	Description
Value (kWh)	Energy consumption
%	Energy consumption as a %
# Cont.	Number of meters
Norm. val.	Normalised value (energy per meter)

Field	Description
%	Normalised value as a percentage
C.C.	Cooling capacity
Val/C.C.	Value/cooling capacity
%	Percentage value

6.5   Create report template for usage KPIs

There are two types of templates for comparing the energy performance of different sites:
1. "benchmark": comparison of data presented in table form (number of sites: unlimited);
2. "analysis": comparison of data presented as a pie chart and time distribution with histogram (number of sites: MAX 4).

Menu path: Usage ☾ Benchmark ☾ Report templates

Fig. 6.m

DETAIL PAGE1
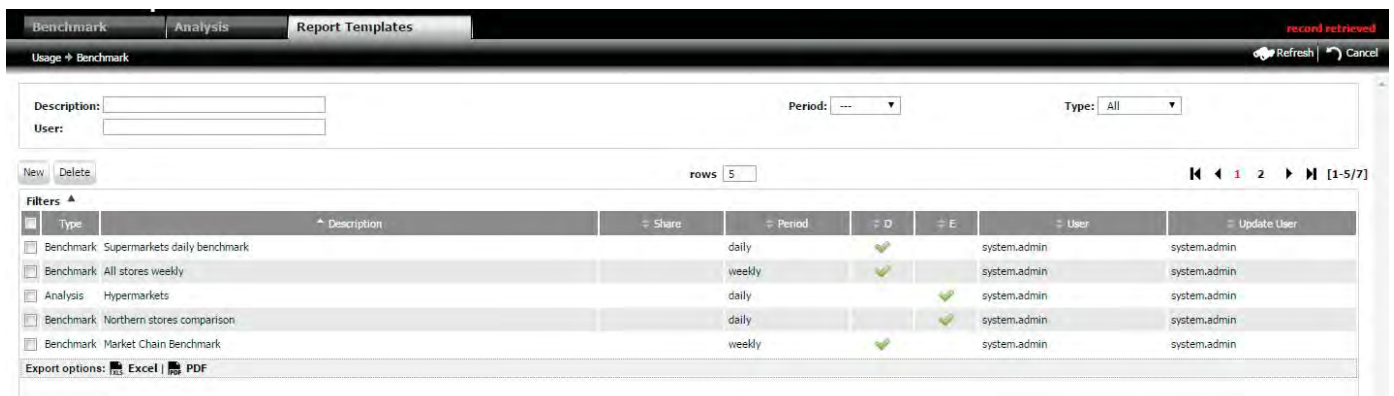
Fig. 6.n

Field	Description
Kpi template	
Type	Type of report: Benchmark, Analysis
Description	Name of the report
Public	Private: visible only to members of the user's company
	Shared: visible to everyone
Channel	Email: report sent via mail
	Download: report saved in Reports -> Reports archive
Data (filters)	
Plant type	Select one or more types: Hypermarket, Super, Convenience, Express, Discount, Cold store, Other. NOTE: no checkboxes selected is equivalent to all checkboxes selected
Open	24/7 (24 hours a day, 7 days a week), Not 24/7

Field	Description
Email to send export	As per export template
Report frequency	Data sampling frequency
Period	Period of data representation (from the starting date)
Area	Site area
Plant	Click the selection box: a drop-down menu is shown for selecting 1 to 4 sites (MAX 4 only for "Analysis")

The procedure for creating a new report is similar to the procedure described under "Navigation".

6.6   Usage benchmarks

These reports compare consumption between two or more sites, listed in decreasing order of energy consumption (over a certain time interval).

Menu path: Usage ☾ Benchmark ☾ Benchmark

Fig. 6.o

Procedure 1: usage benchmark (comparison) between different sites in table form.
1. Click (1): a drop-down menu is shown for selecting the report template, by double clicking;
2. To change the values of the filter fields, loaded by the report template, enter them manually (e.g.: to add/remove sites, use field (3) and then click "Search");
3. Click "Search";

Note: the data is shown in table form, with columns relating to total energy (Energy), divided by refrigeration unit (medium and low temperature units combined), lights, air-conditioning unit, loads and generic consumption. The last column - "Other" - represents the difference between global energy and the sum of consumption values divided by type (partial).

The same data can be represented on a pie chart and time-based histograms, so as to compare consumption data by time.

Procedure 2: time-based analysis of an individual site at different intervals.

Complete procedure 1 to show the data in table form.

1. in (4), select the checkbox only relating to the site being analysed and click "Analysis";
2. a page is shown with the consumption values for two different periods: set the start analysis date for the two periods and the duration, and click "Search"; the trends in consumption over time are shown on histograms.

Note: clicking the histogram for a time unit (e.g.: hour) adjusts the pie chart change so as to represent the information with the same resolution. Click outside of the histogram to return to the global pie chart.
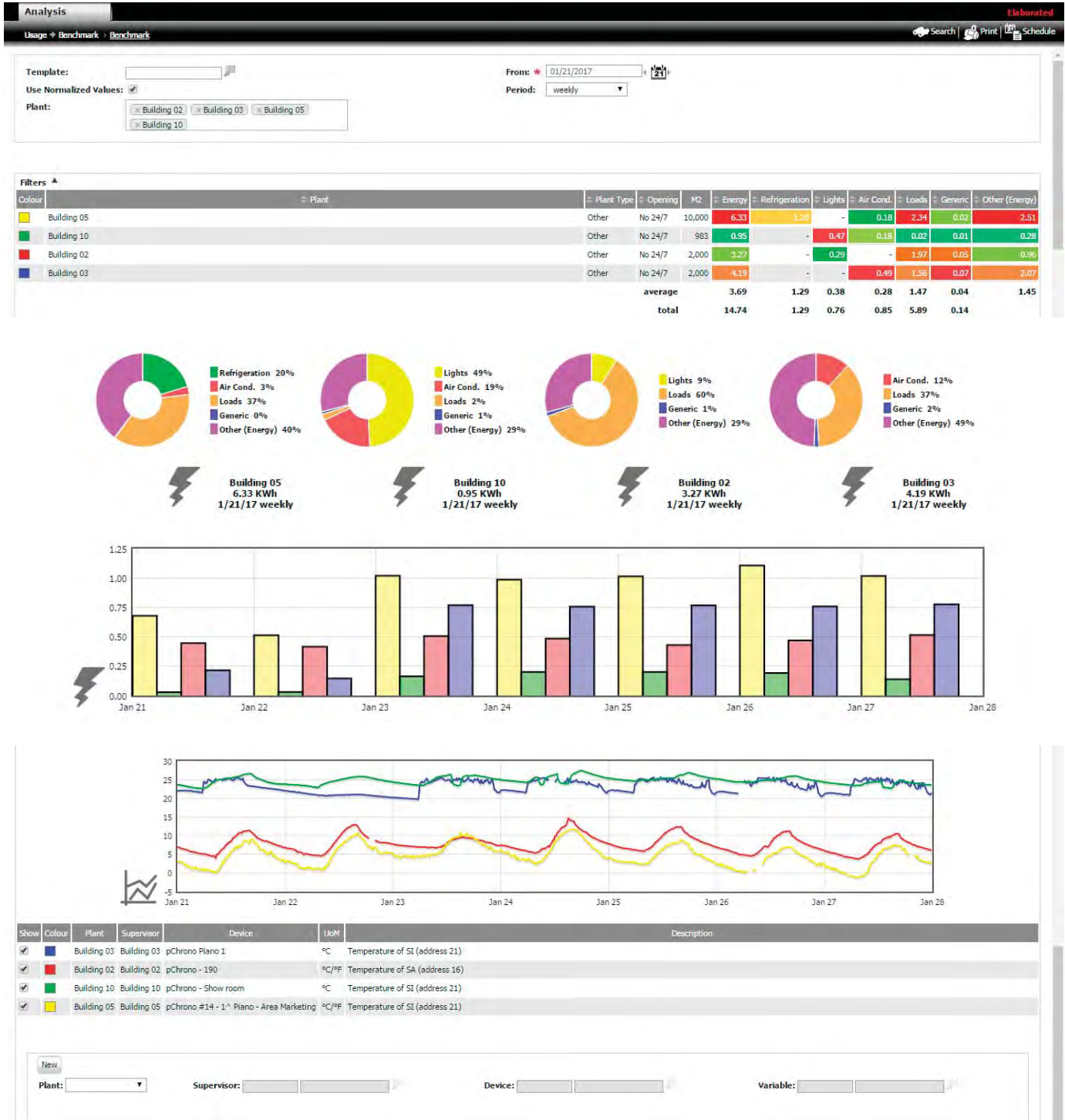
Fig. 6.p

Procedure 3: add a variable

1. click 5, 6, 7, 8 to filter the data based on the site, supervisor, device and variable;
2. click (9) "new" and "Search" to update the data and show the graph.

Note: additional variables can be useful, for example, to compare air-conditioning system consumption against outside air temperature and relative humidity over time.

Procedure 4: time-based analysis of different sites

Complete procedure 1 to show the data in table form.

1. In (4) select the checkboxes relating to the sites (MAX 4) being analysed, and click "Analysis";
2. The trends in consumption over time are shown on histograms.

ANALYZE
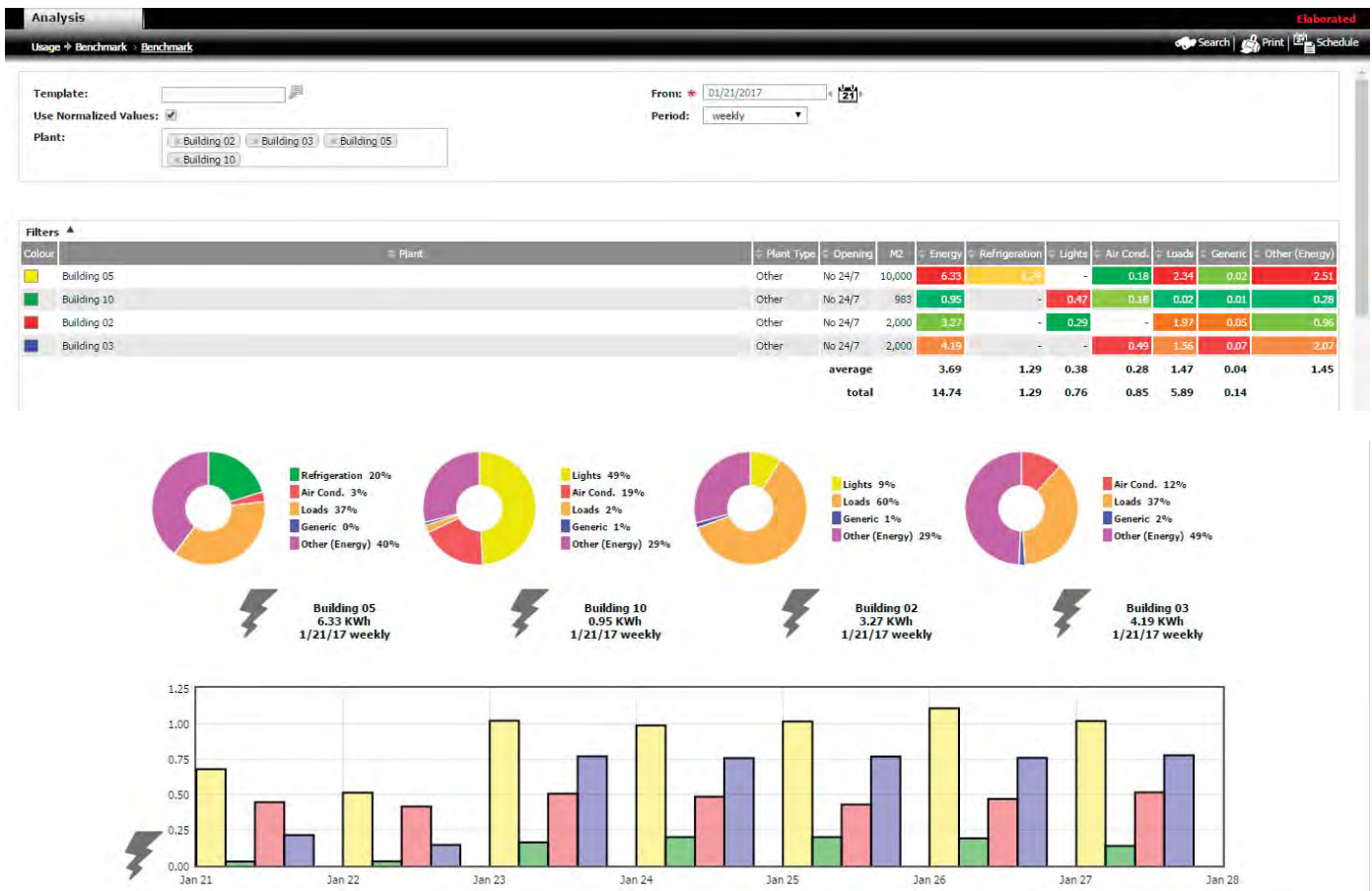
Fig. 6.q

Field	Description	Field	Description	Field	Description
Colour	Colour used to represent the site on the histogram	Energy	Total energy consumed	Loads	Energy consumed: loads
Plant	Reference site	Refrigeration	Energy consumed: refrigeration	Generic	Energy consumed: generic loads
Plant type	-	Lights	Energy consumed: lights	Other	Difference between total energy and sum of partial energy values
Opening	24 hours / 7 days, or not	Air-cond.	Energy consumed: air-conditioning		

➡ **Note:**
- Based on the analysis period, the histogram represents the data distributed over different intervals:
  - ☐ 1 day -> 24 hours;
  - ☐ 1 week -> 7 days;
  - ☐ 1 month -> 30 days;
  - ☐ 1 year -> 12 months.
- the colours in the site table are defined under: Usage -> Detail -> KPI configuration;
- the colours on the pie charts (not modifiable), are used to compare partial energy consumption (air-conditioning/refrigeration/lights,…) on the sites;
- the colours on the histogram, which represents specific consumption over the period, are the same as in the first column of the site table;
- the colours on the graphs of additional variables relate to the corresponding site;
- if the sites also have water and gas meters, other tables will be displayed.

6.7 Usage analysis

This report compares consumption between 1 … 4 (MAX) sites, listed in decreasing order of energy consumption (over a certain time interval), in table form, on pie charts and histograms.

Menu path: Usage → Benchmark → Analysis

The procedure is similar to procedure 4 described in the previous paragraph, without making the selections. Use the "Analysis" template.
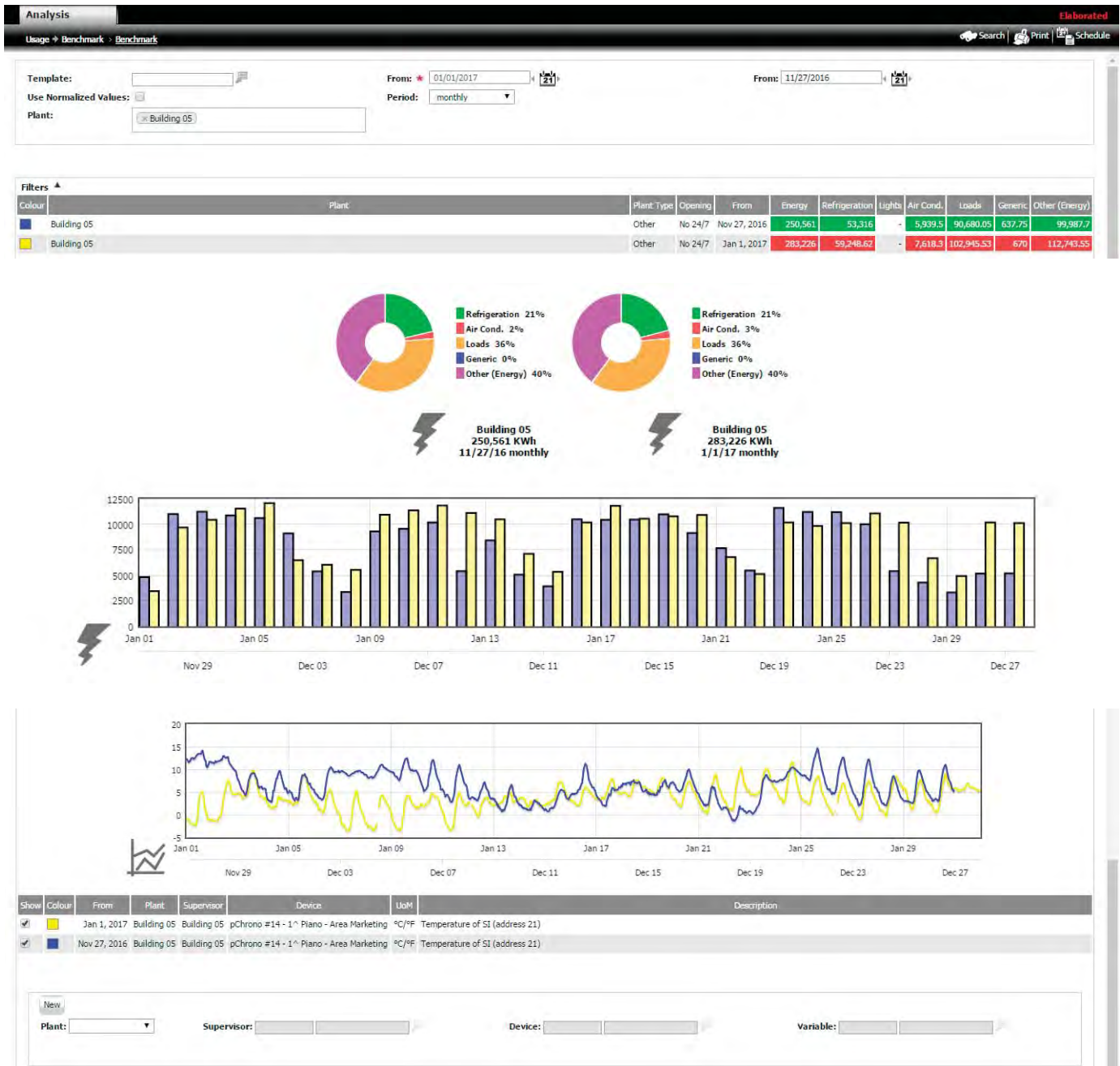

Fig. 6.r

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6.8 Parameter broadcast

The parameter broadcast function is used to simultaneously manage the value of one or more parameters on a group of controllers/devices across numerous sites, based on pre-defined rules. The broadcast function can be activated manually by the user, or scheduled.

EXAMPLE: one way to implement an energy saving strategy, in a certain time period, may be to change the temperature set point and differential for all the controllers on a specific site.

Menu path: Activity → Parameter Broadcast
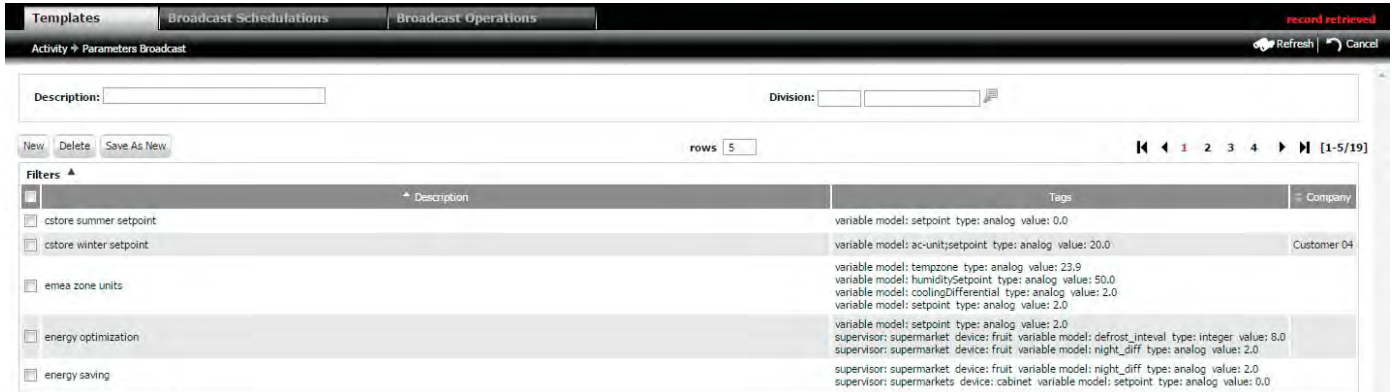
Fig. 6.s

DETAIL PAGE1
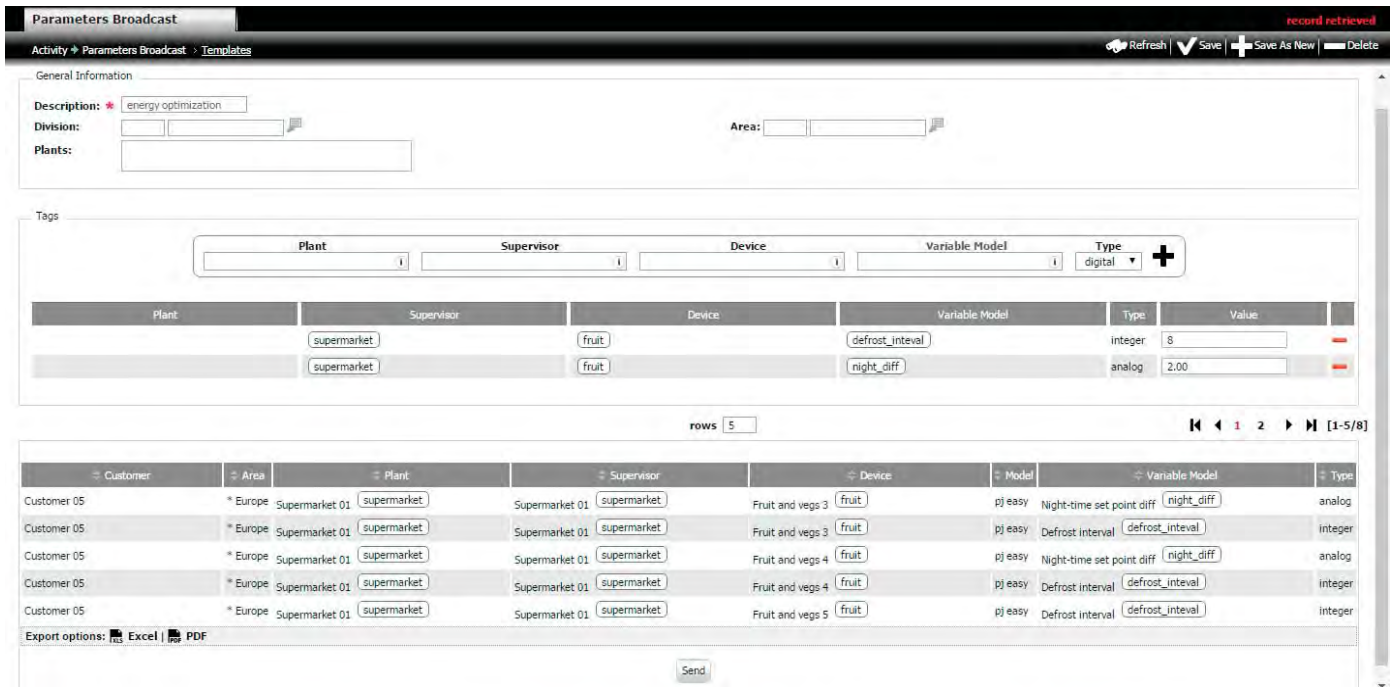
Fig. 6.t

Procedure: Create a recipe (rule) for broadcasting the parameters

1. click (1): the secondary page is displayed (to copy an existing recipe select it and click "Save as");
2. enter (2) the description (name) of the recipe;
3. specify the customer (3), the area (4) and the sites (5): these fields act as filters on the set of devices that the recipe will manage;
4. under Tag (6): click the arrows: drop-down menus will be shown for selecting the tags relating to the site, supervisor, device and variable for the recipe being set, and the type (digital, analogue, integer);
5. finally click (7) "+": a row is shown in zone (8) that specifies which devices and variables will be managed by the recipe;
6. repeat steps 4, 5 to add new variables to the recipe;
7. click (9): zone (10) displays the devices that will be involved in the broadcast function;
8. finally click (11): start broadcast.

Note: if on a controller the value of a parameter is outside of the allowed limits, the change will be ignored. Consistency (e.g. verification that the new set point is between the minimum and maximum values) is managed by the local supervisor.

6.8.1 Scheduled broadcasts

As well as being started manually, a broadcast can also be scheduled. When scheduling a broadcast, the administrator also defines which users are able to start the broadcast..

Menu path: Activity ☾ Broadcast schedulation
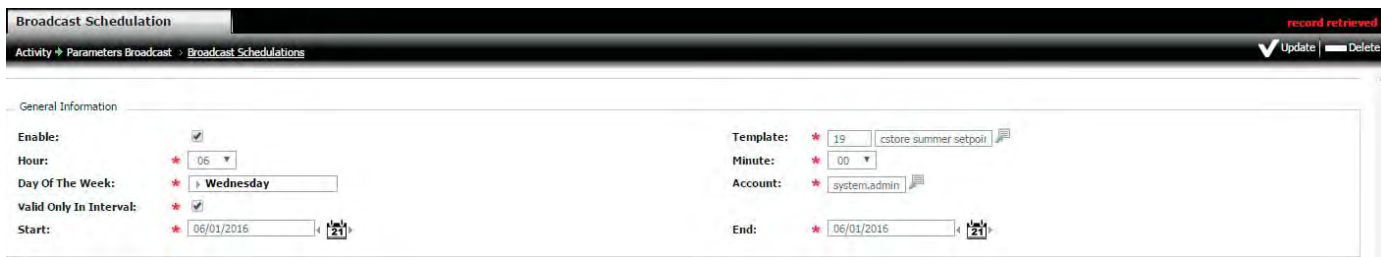

Fig. 6.u

DETAIL PAGE1

Fig. 6.v

Procedure: Scheduling a broadcast
1. click (1), the secondary page is displayed; in (3) select the recipe template being scheduled, or alternatively:
2. double click the recipe row: the secondary page is displayed;
3. check (2) to enable scheduling and the hours/minutes and day of the week for broadcasting;
4. select the user account (4): see the table below for the permitted operations based on the profile.

Note: the "user" level account cannot access the "Activity" menu and thus "Parameter broadcast". Nonetheless, the administrator can assign scheduling to a "user" level account; if the account has authorisation to perform the broadcast operations on the local supervisor, these will be performed.

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6.8.2 Verify broadcast outcome

Once a broadcast has been completed (manual or scheduled), the outcome can be verified.

Menu path: Activity ☾ **parameter Broadcast** ☾ **Broadcast oprations**
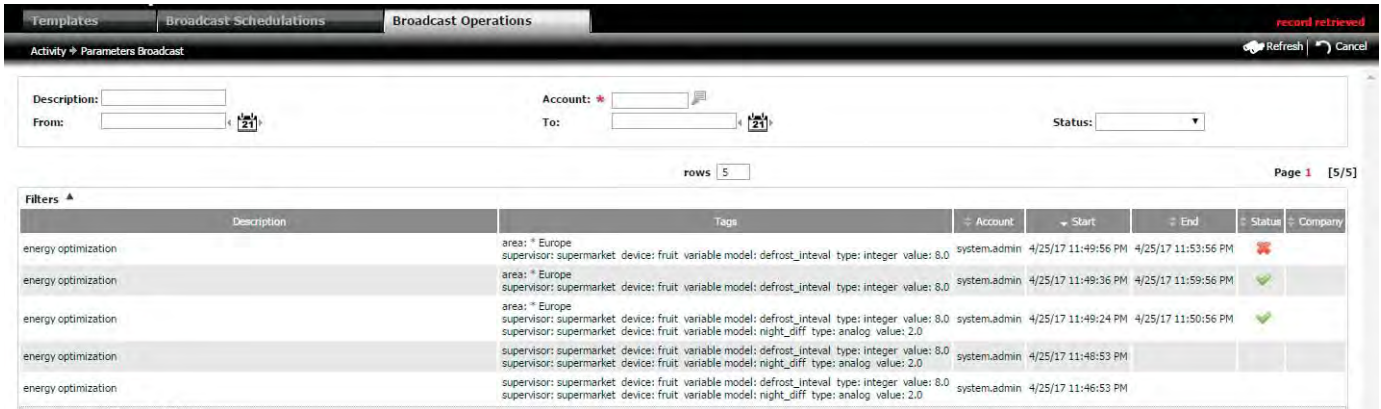
Fig. 6.w

DETAIL PAGE

Fig. 6.x

<u>Procedure:</u> Verify broadcast outcome
1. to check the outcome of the broadcast operation, go to: **Activity → Parameter broadcast →   Broadcast operations**, the green check mark (red cross) indicates that the operation was successful (not successful);
2. double click the row relating to the recipe: the secondary page with the details is displayed.

7. PERFORMANCE KPIS

The temperature KPI reports offer users a rapid overview of supervisor performance. By identifying the devices that are not working optimally, corrections can be made to the configuration or parts replaced, so as to prevent the loss of goods and guarantee product quality.

7.1 Create a temperature KPI template

In the KPI templates, data can be grouped by:
- model;
- site;
- supervisor;
- controller.

Menu path: Performance →Temperature compliance → KPI Templates
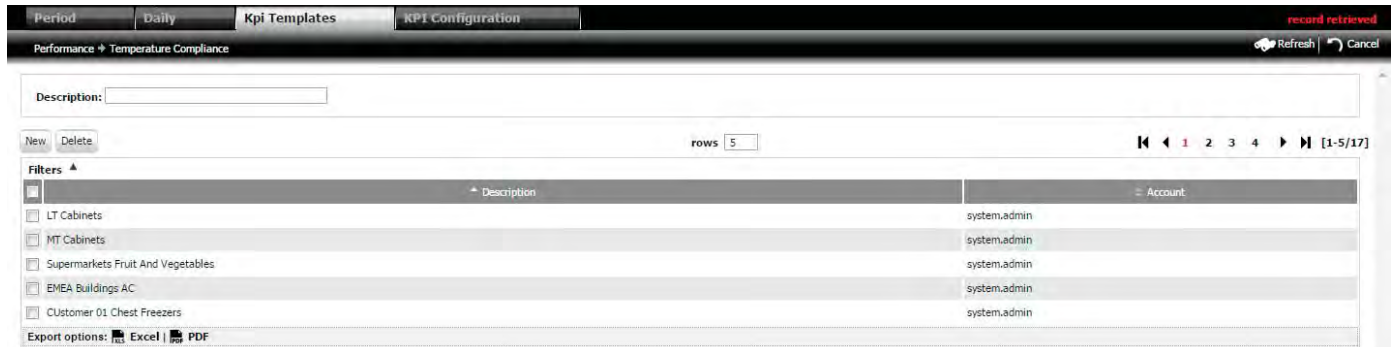
Fig. 7.a

DETAIL PAGE
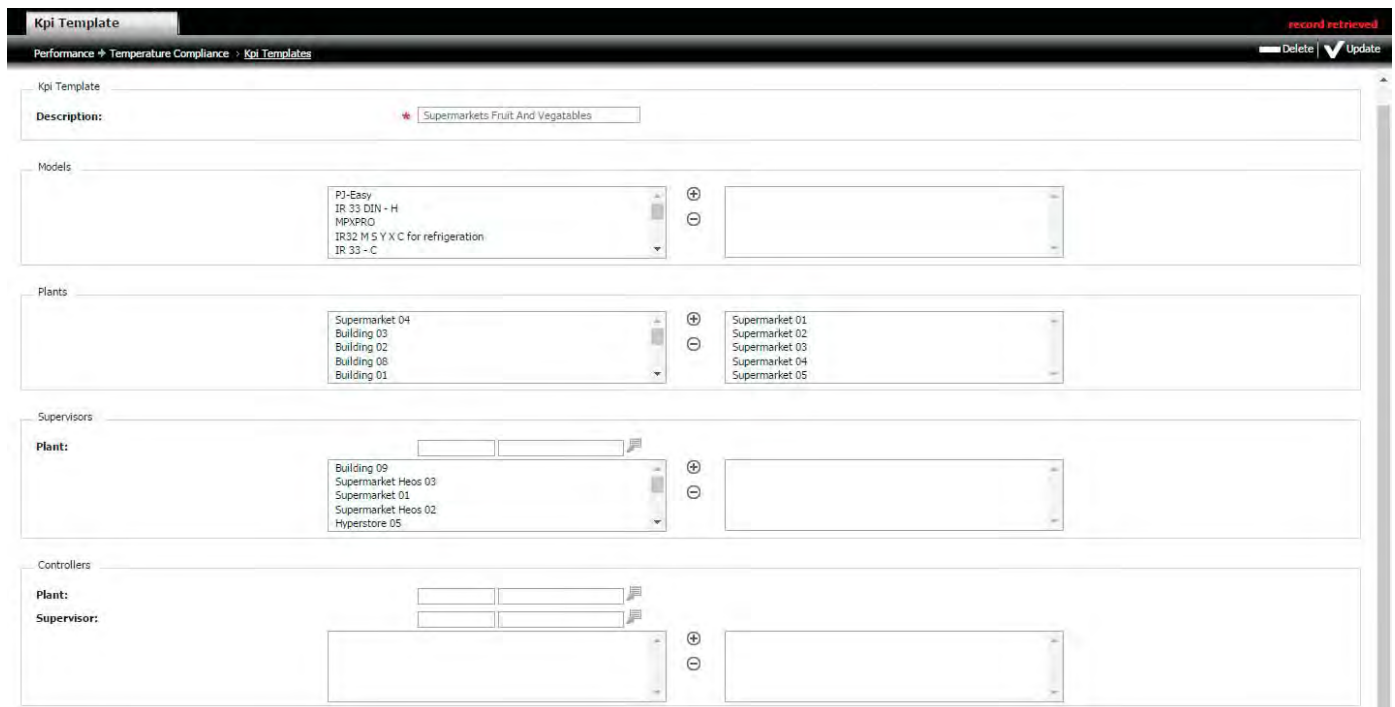
Fig. 7.b

Procedure:

1. Click "new" to display the secondary page and enter the name of the new template and the filter fields, based on: model/site/supervisor/controller;

2. Use the mouse to select and double click (or click ◯) the option to load a model/site/supervisor/controller in the field on the right (similarly, select and click ⊖ to remove it);

3. Click "+New" to create the template only for the current user or "+Create for everybody" to make the template visible to all users.

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7.2 Variables and thresholds for temperature KPI evaluation

Monitoring of control system performance depends on the variables sent to RemotePRO by the local supervisors.

The following variables are considered in the reports:
1. control temperature;
2. set point;
3. differential;
4. cooling (compressor relay);
5. defrost (defrost relay

Menu path: Performance → Configuration → Threshold
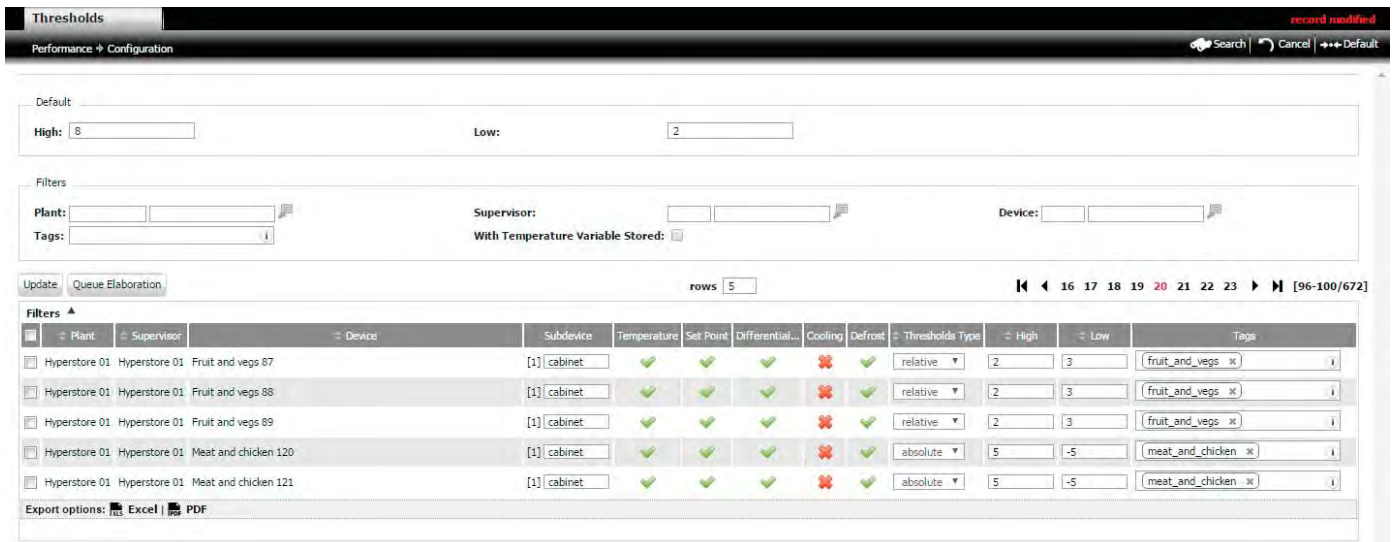
The page displays all the devices that are potentially enabled for performance analysis.

Fig. 7.c

Note:
- the control temperature is the only compulsory variable for performing the analysis. To display only the supervisors that send the "Control temperature" variable, check (2) and click "Search";
- the absolute thresholds are fixed, the relative thresholds refer to the set point. The default thresholds refer to the set point and are shown in zone 1;
- logged variables are marked with a green check, those that are not available have a red cross.

The following situations are possible, in which each zone is numbered and the zone number depends on the number of variables sent.
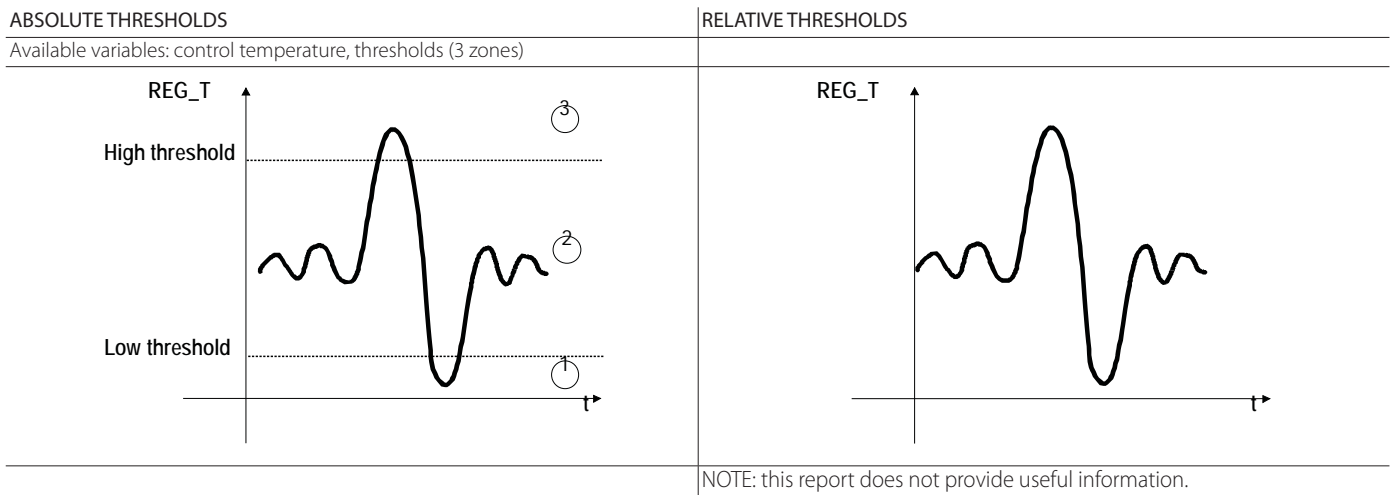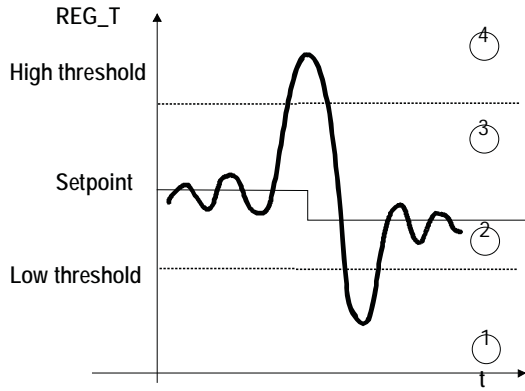
ABSOLUTE THRESHOLDS	RELATIVE THRESHOLDS
Available variables: control temperature, thresholds (3 zones)	

NOTE: this report does not provide useful information.

Fig. 7.d

ABSOLUTE THRESHOLDS	RELATIVE THRESHOLDS
Available variables: control temperature, set point, thresholds (4 zones)	
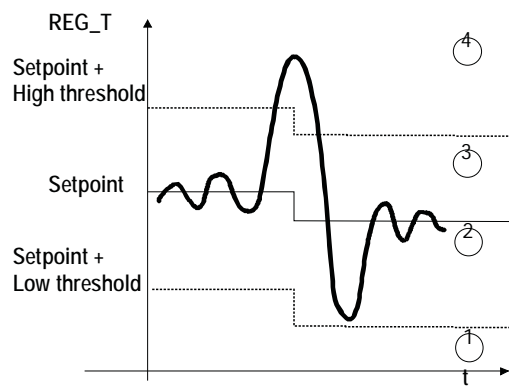
Fig. 7.e

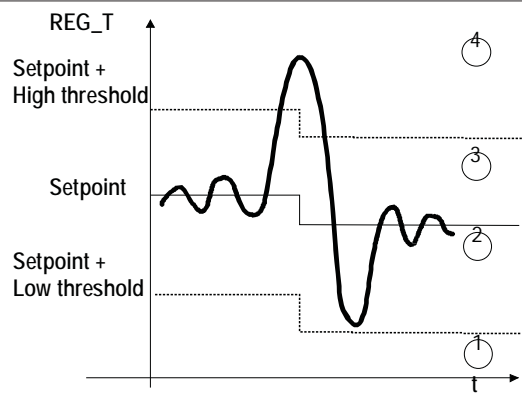| ABSOLUTE THRESHOLDS	RELATIVE THRESHOLDS
Available variables: control temperature, set point, differential, thresholds (5 zone)s	
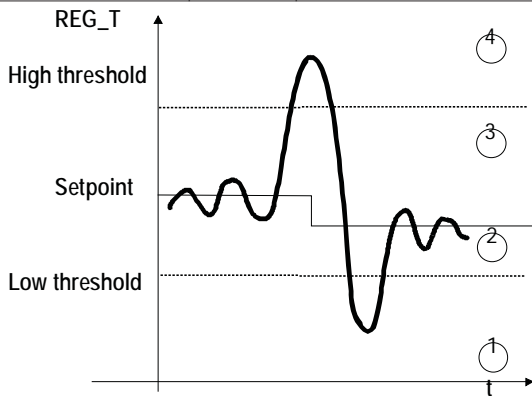
Fig. 7.f

Note: REG_T = control temperature.

7.3 KPI temperature report representation

The areas defined by the 5 parameters: low temperature threshold, set point, differential, high temperature threshold, are represented as follows:

🟥	Over critical	Temperature value above the high temperature threshold (critical)
⬜	Over range	Temperature value between the differential and the high temperature threshold (critical)
🟨	In range	Temperature value between the set point and the differential threshold
🟩	Under range	Temperature value between the set point and the low temperature threshold (critical)
🟦	Under critical	Temperature value below the low temperature threshold (critical)
🟫	Undefined	Temperature value not recordedo

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To change the colours:

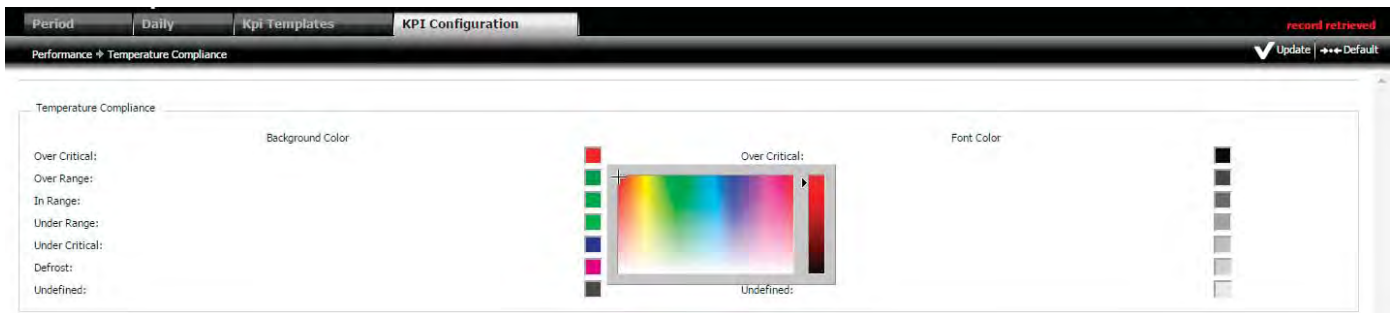**Menu path: Performance → Temperature compliance → KPI Configuration**

Fig. 7.g

Procedure: change the colour of the bar charts
1. select the colours (background and fond);
2. click "Update". The results of the setting will be displayed for all the "Performance" menu items.

● Note: after having set the colours, to make the changes active, it may be necessary to clear browser's cache.

7.3.1 Display temperature KPI reports by period

The data period options are daily, weekly, monthly.
Menu path: Performance → Temperature compliance → Period

DETAIL PAGE1
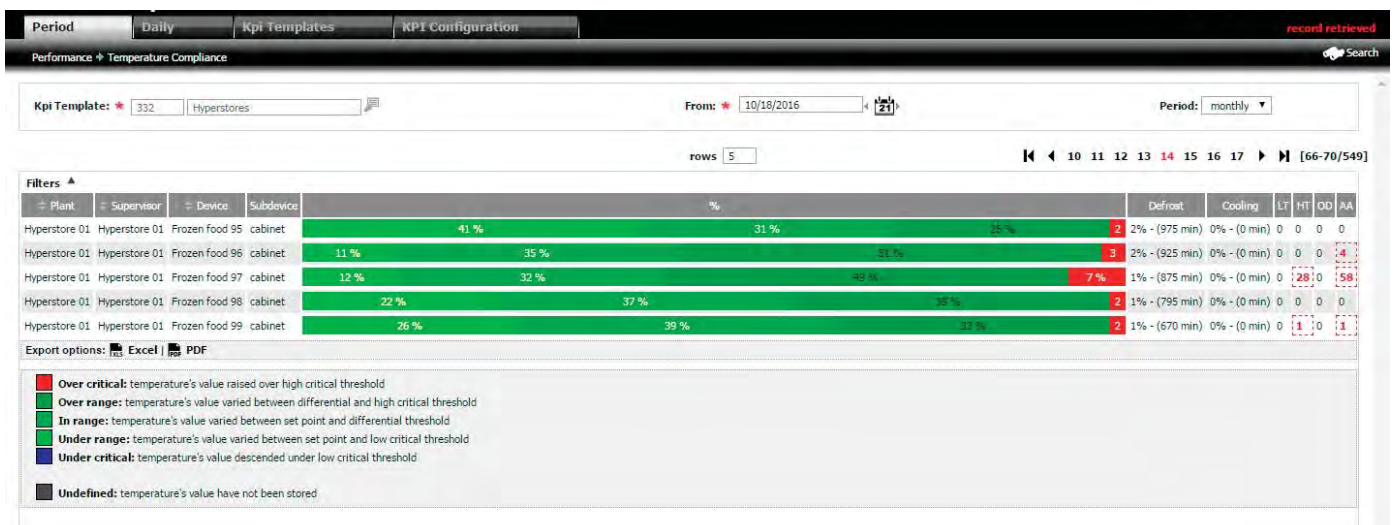(at the bottom right, the numbers in red indicate active alarms)

Fig. 7.h

Field	Description
Plant	Reference site
Supervisor	Reference supervisor
Device	Device name
Subdevice	Sub-device identifier

Field	Description
%	Percentage of time in which the temperature is within the predefined areas
Defrost	%/minutes of defrosting
Cooling	%/minutes of compressor activation
LT	Low temperature alarm

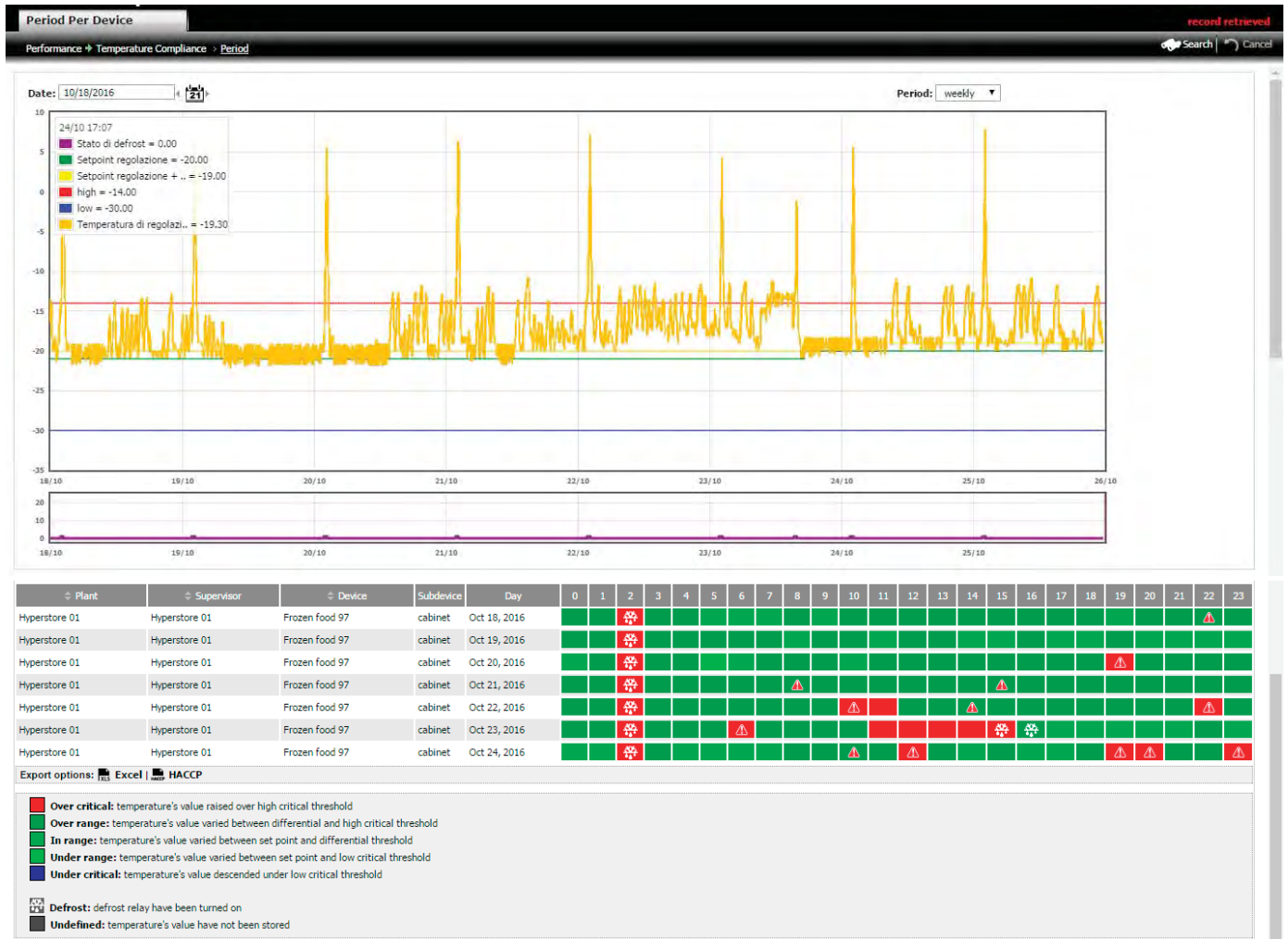| Field	Description
HT	High temperature alarm
OD	Open door alarm
AA	All the alarms

DETAIL PAGE2

Fig. 7.i

Procedure:
1. Enter the KPI template, the starting date and the analysis period;
2. Click "Search": secondary page 1 is shown, with a diagram that expresses the percentage of time in which the control temperature is within the various predefined areas;
3. Double click the row relating to the site (plant): secondary page 2 is shown, with the graph displaying the trend in temperature; each row represents one day.

⊙ **Note**: Double click a row: page 3 is shown, with the graph relating to the device and all of its variable

⊙ **Note:**
the colours on the temperature graphs are fixed, as described in the table below:

VARIABLE	COLOUR
Control temperature	Dark yellow
Set point	Green
Defrost	Purple
High temperature threshold	Red
Low temperature threshold	Blue
Differential	Light yellow

• when clicking the box with the temperature graph colour key, this moves from one corner to the other.

PROCEDURA: HACCP Report

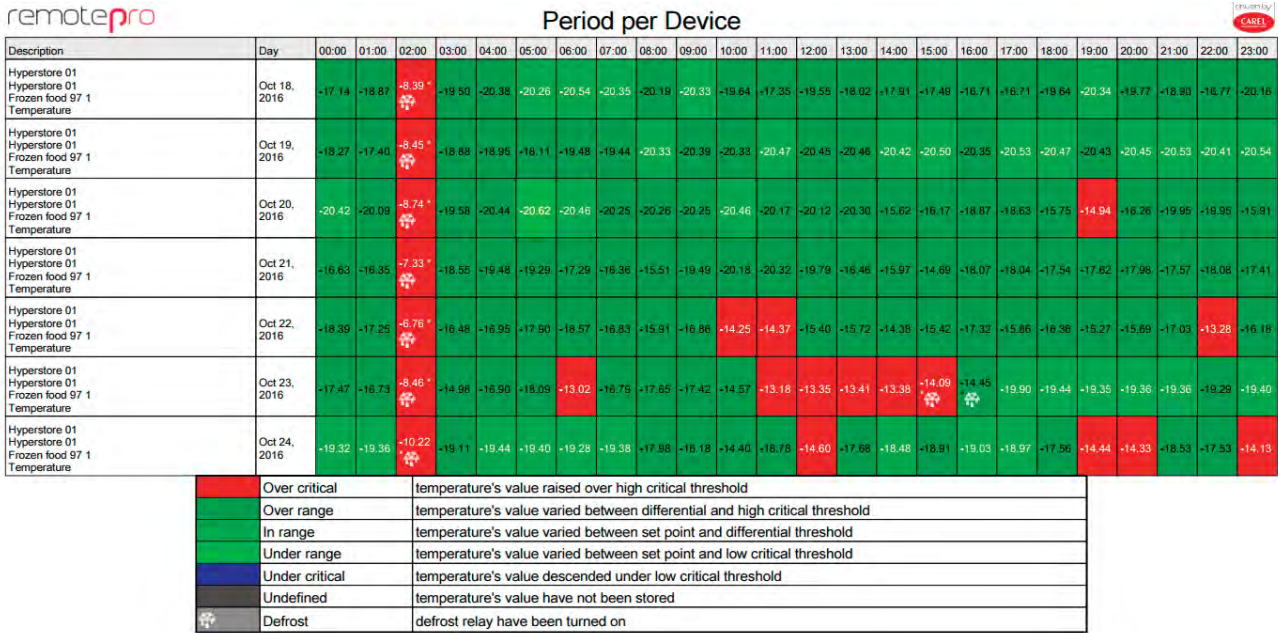Press on "HACCP" text in the botton of table. The result is a PDF file similar to:

Fig. 7.j

7.3.2   Display daily temperature KPI report

In this report, the data are represented on a daily basis, and the behaviour of different devices on the same day can be compared.
The procedure is similar to the one described in the previous paragraph.

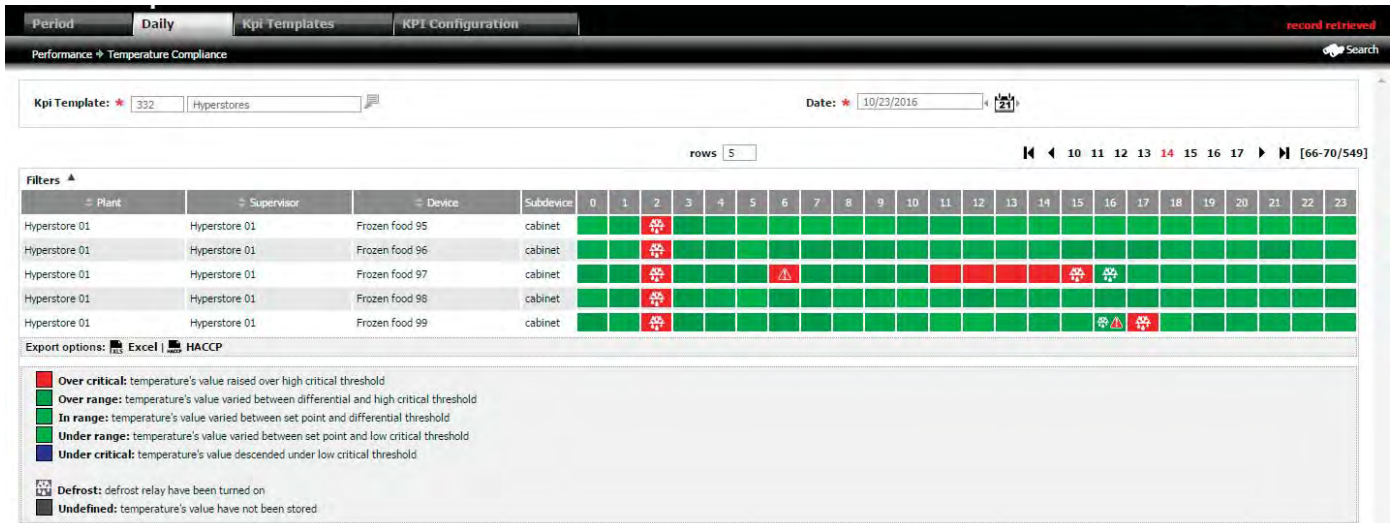**Menu path: Performance → Temperature compliance→ Daily**

Fig. 7.k

8. REPORT

8.1 Export report configuration

Menu path: Report → Configuration→ Export configuration

Fig. 8.a

Field	Description
CSV settings	
Separator	Separator character
Thousands separator	Dec. point or comma, based on the format (e.g. ITA/USA)
Header settings	
Show plant	Include site name
Show device	Include controller name
Group plant	If possible, the site is only shown once in the header
Email	
Subject	Subject of the email with the exported report

Field	Description
Decimal places	Number of digits after the decimal point
Decimal separator	Dec. point or comma, based on the format (e.g. ITA/USA)
Show supervisor	Include supervisor name
Show variable	Include variable name
Group supervisors	If possible, the supervisor is only shown once in the header

8.2 Create template

To select the logged data to be exported, first the template (DataLog) describing which variables are included needs to be defined.
The variables can be selected in the templates in two ways:
1. variable model: the variables are selected according to the model of device; when exporting, all the devices on all the sites with the specified model and the selected variables will be identified
2. variable: the variables are selected individually for each specific device on a site.

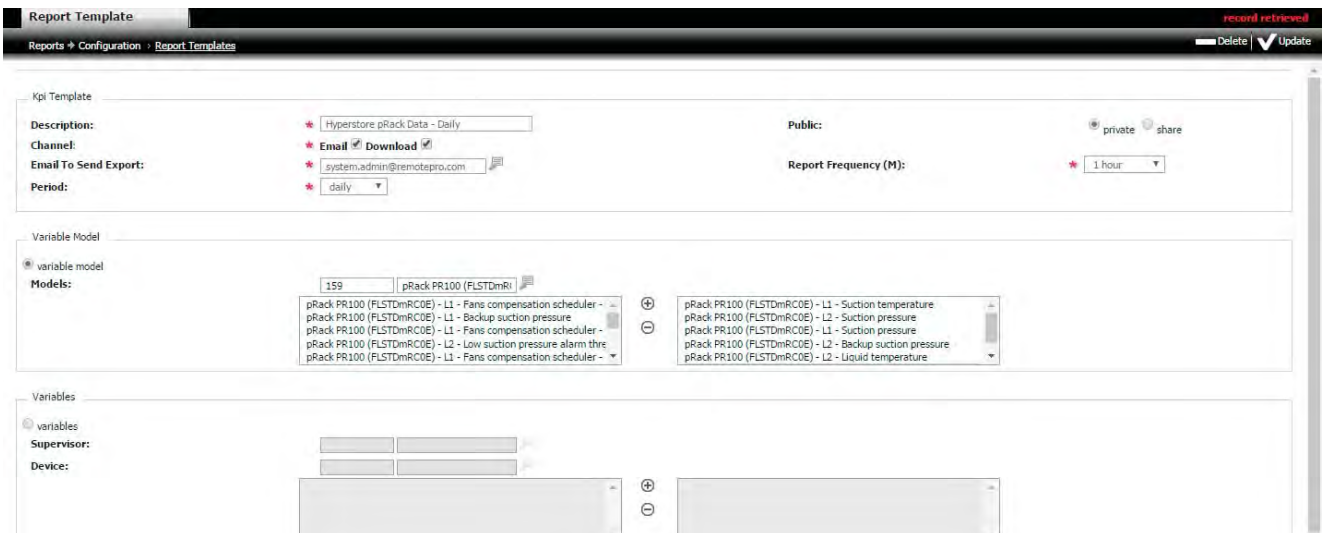**Menu path: Report → Configuration → Report Templates ("New button")**

Fig. 8.b

Template	
Description	Description of the report, used as the prefix for the file name and the subject of the email
Public	Template visibility
	- Private: only available to the user that created it
	- Shared: also available to other users from the same company
Channel	How the report is sent
	- Email: the report is sent as an email attachment
	- Download: the report is saved on the server and can be viewed online in the "Reports archive"
Email to send export	Email address that the report will be sent to. Multiple addresses can be entered, separated by a semi-colon ';'
Report frequency	Frequency for logging the variable values
Period	Time interval of the exported data: daily, weekly, monthly

Procedure: (create template)
1. enter the description of the new template and the fields that define the report;
2. select the variables by model or supervisor/device.

⊙ Note:
 • when selecting "Variable model", variables can be added from known models, and the data relating to these variables exported from all instances of that model. If selecting "Variable", on the other hand, the data relating to the selected variables will be exported;
 • it is not possible to export specific variables and model variables at the same time.

8.3 Manual export

This option generates a report manually. The fields are initially populated with the default values defined in the selected template. The values can then be changed before clicking the button to generate the report.

Menu path: Report → Export export

Fig. 8.c

Field	Description
Template type	Type of template to be used: • DataLog • Energy Benchmark (Benchmark/Analysis, see the corresponding section) • HACCP (daily "Temperature compliance", see the corresponding section)
KPI template	List of available templates, filtered according to the selected type
Description	Description of the report, used as the prefix for the file name and the subject of the email
Channel	How the report is sent • Email: the report is sent as an email attachment • Download: the report is saved on the server and can be viewed online

Field	Description
Email to send export	Email address that the report will be sent to. Multiple addresses can be entered, separated by a semi-colon ';'
From	Report starting date
Period	Interval of the exported data: daily, weekly, monthly

Procedure: export report:
1. select the type of template, the name, the interval of data analysis (starting date and period) and how the report is exported: if sent by email, enter the address;
2. click "Queue elaboration" to start exporting the report;
3. at the top right, the message "record queued" is displayed;
4. after processing:
    i. the report will be sent by email, or
    ii. will be available under Reports -> Reports archive.

⊙ Note: once started, this process will be run in the background.

8.4 Scheduled export

This function is used to generate a report at a scheduled time. The fields are initially populated with the default values defined in the selected template. The values can then be changed before clicking the button to generate the report.

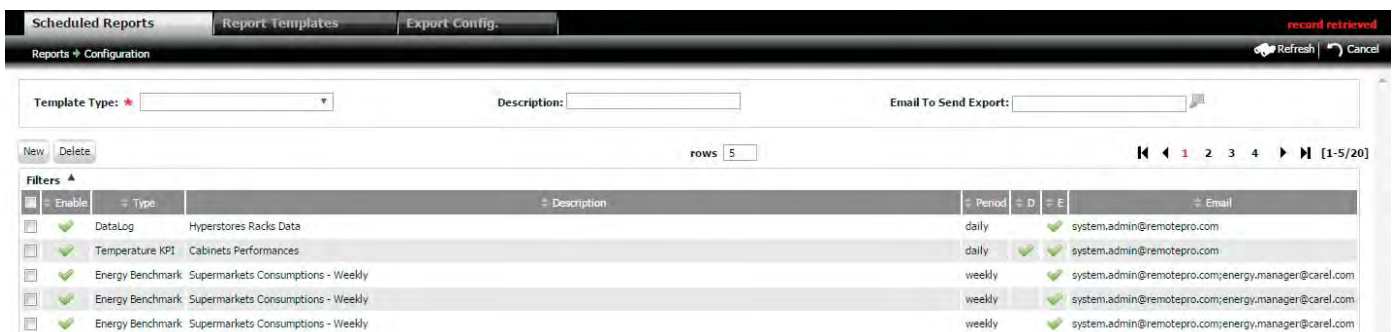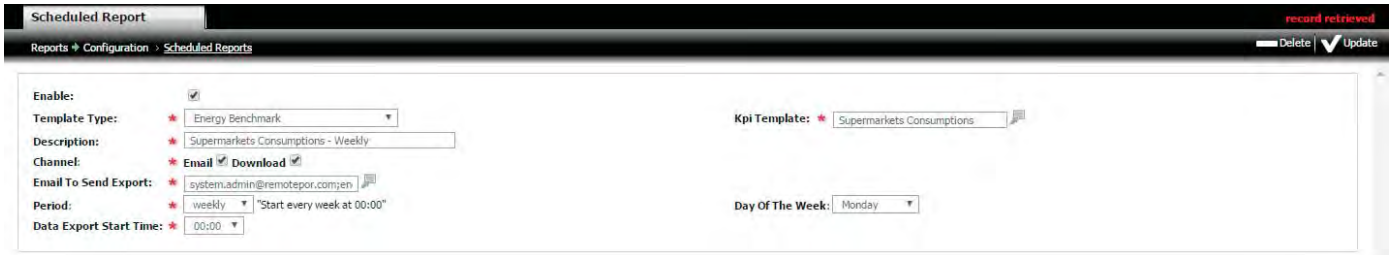**Menu path: Report → Configuration→ Scheduled Report ("New" button)**

Fig. 8.d

Fig. 8.e

Field	Description	Field	Description
Template type	Type of template used: • DataLog • Energy Benchmark (Benchmark/Analysis, see section on usage KPIs) • HACCP (daily "Temperature compliance", see section on performance KPIs)	Email to send export	Email address that the report will be sent to. Multiple addresses can be entered, separated by a semi-colon ';'
KPI template	List of available templates, filtered according to the selected type	Period	Scheduling period and interval of the exported data: daily, weekly, monthly
Description	Description of the report, used as the prefix for the file name and the subject of the email	Day of the week	Scheduled day for exporting the report
Channel	How the report is sent • Email: the report is sent as an email attachment • Download: the report is saved on the server and can be viewed online	Data export start time	Scheduled time for generating the report

> **Note:** reports can only be scheduled with the following frequency:
> • daily: with 24 hours of data
> • weekly: with 7 days of data
> • monthly: with one month of data

8.5   Download reports

The exported reports, both scheduled and generated manually, can be viewed or downloaded.
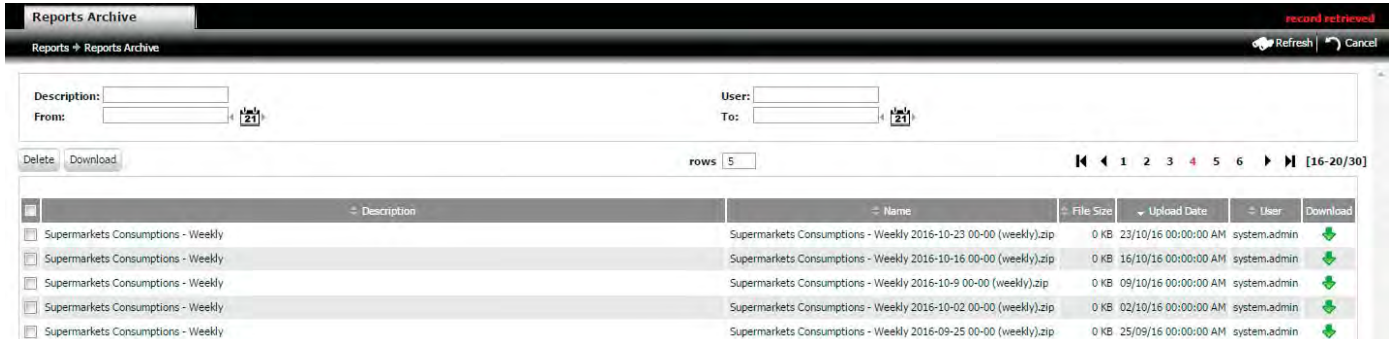
Menu path: Report → Reports archive

Fig. 8.f

Procedure (download)
• click the arrow icon to save an individual document, or
• select multiple documents and export a compressed file containing all the documents by clicking "Download".

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