USER'S MANUAL

KeyAqua 2026.1

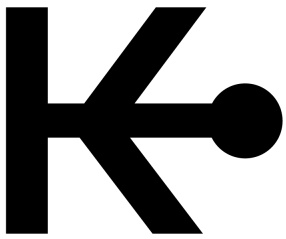


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INTRODUCTION

This user manual describes the functions of the browser-based **KeyAqua** software. The software is designed for the **documentation and management of water and sewer networks**. The software is used to maintain up-to-date information on network objects, customers and maintenance. The generated network model can be utilised for network maintenance, planning and renovation.

The first part of this user manual introduces general tools and buttons, and the rest of this document provides instructions on using the various object forms. The forms are used to create and modify network object information with the help of buttons that have the same functions throughout all object forms. Before reading the instructions on a single object form, we recommend that you read the chapter GENERAL FUNCTIONS OF THE OBJECT FORMS. The chapter in question provides detailed information on the functions of the buttons. The underlying assumption regarding the instructions on the use of object forms is that the user is familiar with the buttons.

The User manual's chapter LOGGING IN AND ACCESSING HELP describes system log-in and log-out, password change, and accessing the User manual during a session.

The chapter MAP VIEW discusses the tools related to the **basic functions in the map view**. The chapter introduces, for example, the selection of background maps and object layers, the use of the coordinate section, address search, and printing functions.

The **buttons and functions** common to all forms are presented in the chapter GENERAL FUNCTIONS OF OBJECT FORMS. The chapter is aimed at users who have no previous experience in using Keypro's browser software. The tools introduced in this chapter are related to viewing the properties and location information of objects, and they are similar to the tools used in Keypro's other browser software.

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The DUCT TOOLS and NODES chapters cover the use of **forms for duct tools and sewer and water duct nodes**. Users are assumed to be familiar with the functions of the object form buttons. All object forms are used in a similar manner, so users do not necessarily have to familiarise themselves with the functions of each individual object form. However, any object form-specific functions are described separately.

The instructions in the MAINTENANCE AND REPORTING TOOLS chapter are aimed at all users. In this chapter, users are assumed to be familiar with the functions of the object form buttons. The featured forms are related to reports on the condition of the equipment and on water leaks, as well as to quality complaints. Furthermore, the creation of leak areas is also described.

The use of the Customer and Consumer point forms is described in the chapter CUSTOMER/CONSUMER POINT. This chapter is recommended for all users because the actions on these forms differ from those on other forms. The chapter discusses the use of the property values of **customer information, agreements and consumer points**, and the linking of such information.

The chapter OTHER TOOLS discusses tools that are related to **viewing network objects**, **maintenance** and the **management of surveys** that have been carried out. This chapter is aimed at all users.

The terms related to the use of KeyAqua are covered in the GLOSSARY. This chapter provides explanations of terms, and you can use it for reference if you do not know the meaning of some terms.

Software overview

The software is used through Internet browsers and requires no additional software installation on the user's workstation or mobile device. The network data that is used is stored **in an online database** from where the browser receives the data.

The KeyAqua software is intended to be used as a tool for:

- Managing and documenting the components of water and sewer systems (location and property information).
- Documenting and managing the connections between network objects.
- Fault management in accordance with workflows.
- Preventive maintenance, documentation, analysis and reporting.
- Supervision of work.

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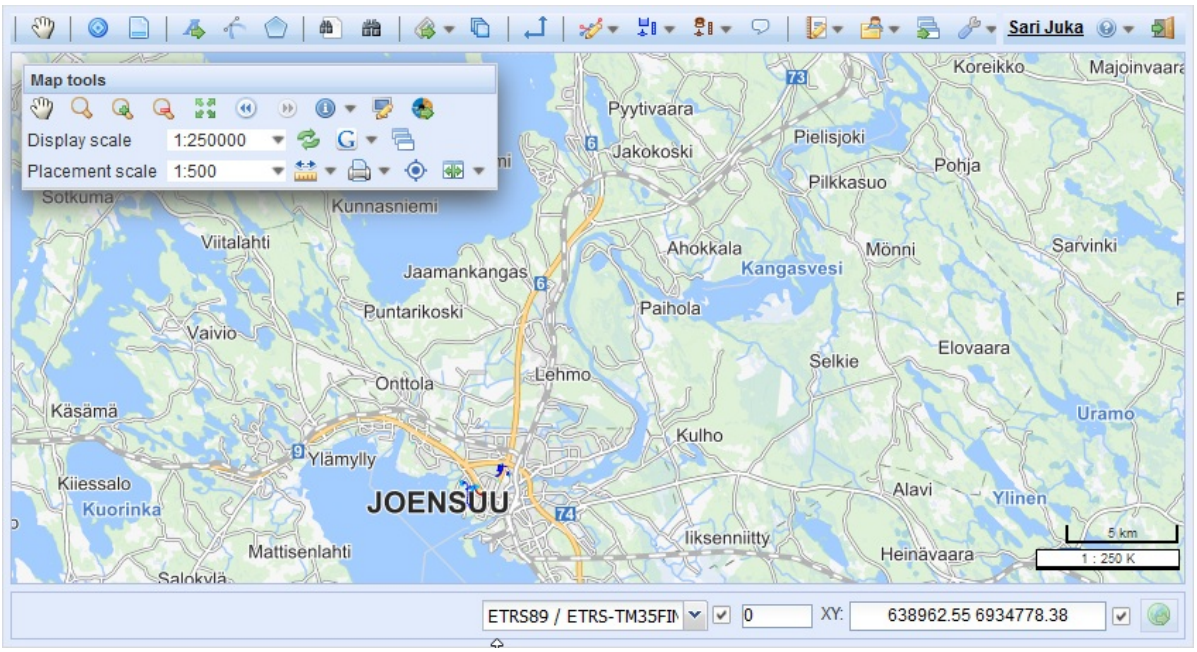
You can handle the network data through **object-specific forms for various types of network objects**. The functions available to you, meaning the actions that users can take, depend on your **access rights**. For example, if you want to view data related to a fireplug, open the Fireplugs form. If you want to create a new sewer duct in the system, you can do that on the Sewer duct form. In other words, you use object forms to view, create, and update information on both properties and location.

Network objects can be associated with a range of **information on their condition and maintenance** (events). This includes information such as **water leak reports**, **state reports** and **quality reclamations**. When an event and the related network objects have been linked together, the event form can also be used to view the network object linked to it. Similarly, you can view the network object to see not only the property attributes but also the events related to the object.

The forms for maintaining network object-related information are grouped into **duct tools**, **sewer node tools** and **water node tools**. In addition to these, forms can be used to create various events and to maintain consumer point and customer data.

User interface

The user interface consists of a toolbar, map view, and coordinate section. The **toolbar** is displayed at the top of the screen, and you can use it to open object forms to view and edit objects. The toolbar also includes other tools, such as tools for searching addresses and reading survey files.



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The **map view** is the largest displayed section, which also includes a separate toolbar with **Map tools**. This toolbar can be freely moved and it also includes the Layers tool for layer selection. **Map tools** enable you, for example, to zoom in and out in the map view, measure distances, and print the views you need.

A **coordinate section** displaying coordinate values is located at the bottom of the screen. In the coordinate section, you can define the so-called Active Z setting for objects, enabling the objects to have this value as their default Z-coordinate. With the coordinate section, you can also go to a coordinate point that you specify by entering the coordinates. In addition, the **instructions bar** at the bottom displays **instructions** when various buttons and tools are used.

Note! If the border of the user interface is of a very bright colour, you are most likely using the test environment.

Hardware requirements

You use KeyAqua via your web browser, so the minimum requirements and recommended equipment greatly depend on the browser you use:

1. **Browser:** Microsoft Edge or Google Chrome with the latest updates. Firefox is also supported but require the fastest possible CPU (i7, i9). You must also enable cookies in the browser.
2. **Operating system:** Should be in accordance with the browser's requirements. Keypro Oy tests the system functionalities with Windows-based equipment. Linux Ubuntu 18 or newer is recommended.
3. **Processor:** The minimum CPU is Intel Core i3. Intel Core i5 or i7 are recommended (or some equivalent from the AMD).
4. **Display:** Minimum resolution of 1366 x 768 pixels (1920 x 1080 pixels recommended).
5. **RAM:** Minimum 8 GB (16 GB recommended, with browser requirements considered).

User roles

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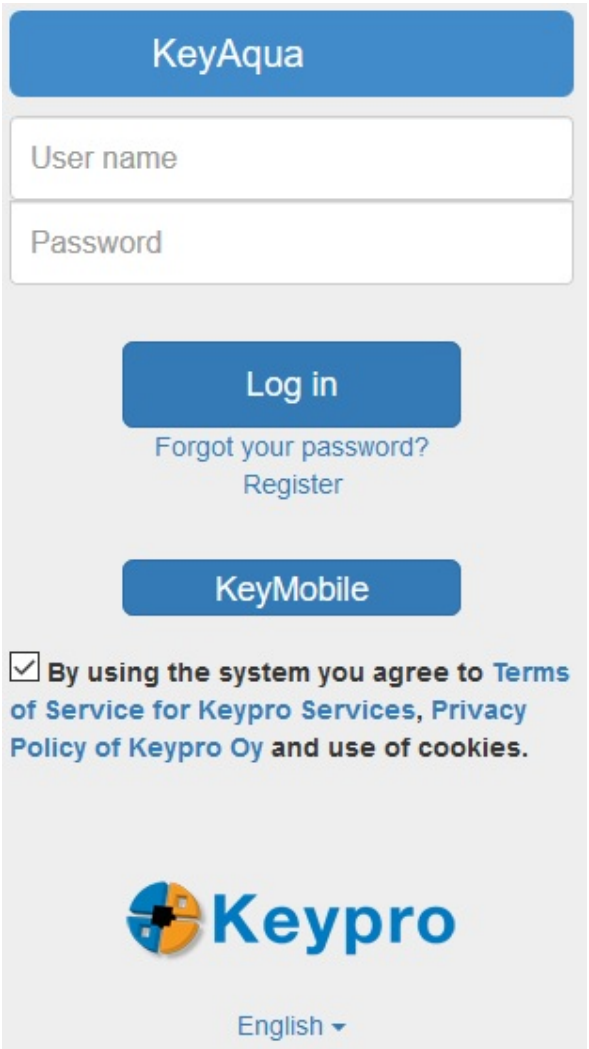
Users are assigned a role in the system, and the **user privileges** specified for that role define the functions that are available to the user; in other words, they define the actions that the user can take within the program. **Read-only users** can view both the properties and location information of objects, but they cannot edit or add objects in the system. The buttons required for these functions are not even visible to users with read-only rights. If a user has **read and write rights** to properties or location information, the related buttons are visible. In addition to the above, an **Admin user** can, for example, modify default values. The tools and functions available to the user are determined based on user rights.

The system also allows the definition of so-called **area-specific user privileges** that provide users with the right to view and handle objects within a certain area only. Limitations can also be set based on, for example, the owners of objects.

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LOGGING IN AND ACCESSING HELP

Logging into the system



To log into the system, open your **Internet browser** and then enter the address for the **KeyAqua** service in the address bar of your browser. When the log-in form is displayed in the browser, enter your personal **KeyAqua username** and **password** in the fields. Your session will start when you click the **Log in** button. You can also select the mobile version for smart devices by clicking the KeyMobile button.

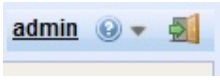
If you do not yet have a user account, you can click the **Register** link to request user rights.

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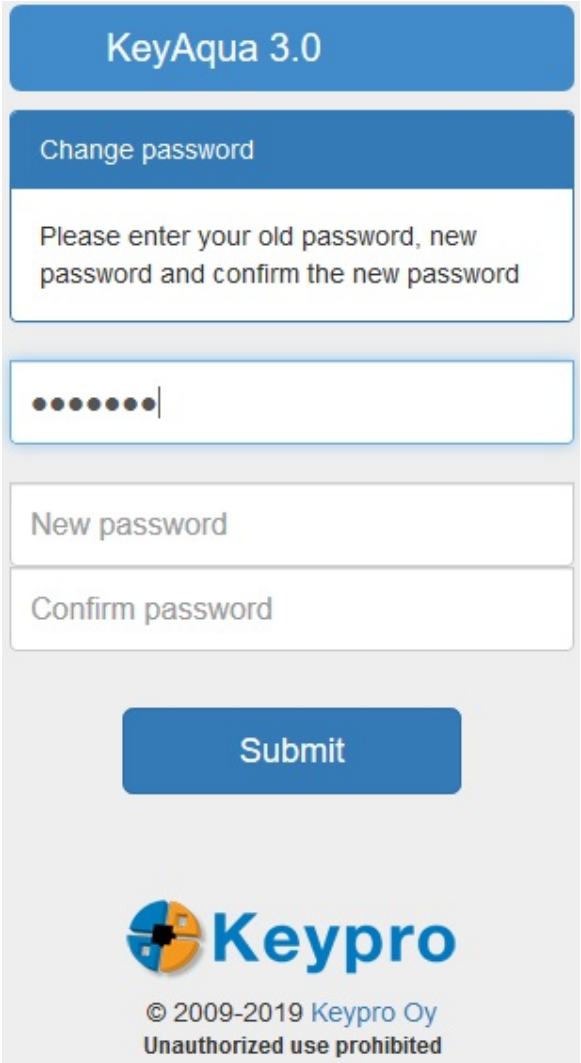
If you receive the notification **Please enter a correct username and password** (note that the fields are case sensitive), you have entered either a wrong username or a wrong password. Enter the correct information and try again. Contact your system administrator if necessary.

Changing your password

You can **change your password** by clicking your user name on the toolbar in the top-right corner. Your user name is a link to the page on which you can change your password.



On the form that is then displayed, enter your new password twice in the appropriate fields. Then click **Submit**. New users can be forced to change their password when they first log in.



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User guides, information, and support

User manuals and information related to the application can be found in the drop-down menu for **Help** , which is located in the top-right corner (the content of the menu may vary, depending on the installation).

In the **User's guides** menu, select **KeyAqua User Manual** to open this document in PDF format. The **KeyMobile User Manual** is available in the same menu.



The **About** item in the **Help** menu displays general information on the application, such as the version number and coordinate system.

Select **Support** to open a pre-configured email message in an email application. You can complete this draft message and send a support request. The pre-filled information on the application version and settings is useful information for the application support service.

You can access the Keypro website by selecting **Keypro** from the menu.

Tip:

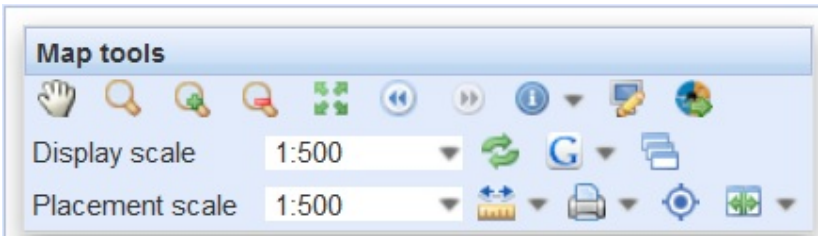
When you contact **Keypro's** application support, be prepared to provide the exact version number of the application you are using. To find this information, go to the **Help** menu and click **About**. In the Help menu, click **Support** to submit a support request.

Logging out of KeyAqua

You can end your **KeyAqua** session by clicking **Logout** in the main menu.

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MAP VIEW

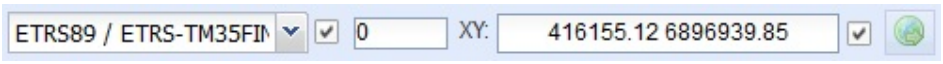


Panning the map

You can pan the map by clicking **Pan** in map tools. Hold down the left button of your mouse and move the mouse pointer across the map to pan the map. This enables you to move the map in the background, for example, when you are drawing a new duct.

Coordinates

The coordinate section displayed in the bottom-right corner shows the map coordinates for the **location of the mouse pointer** if the checkbox **Coordinate reading on/off** to the right of the coordinates is selected. You can turn coordinate reading off by deselecting the checkbox. Coordinates are visible in the field, with the first one being the east coordinate and the second one the north coordinate. The coordinate values are separated by a single space.



Centre map on given coordinates

1. Enter (or paste from the clipboard) the coordinate values in the coordinate field. Note that the east and north coordinates are separated by a single space.
2. Deselect the **Coordinate reading on/off** checkbox to prevent the coordinate values from being updated when you move your mouse pointer on the map.
3. Click **Center map on the given coordinates** .

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Placing an object at the given coordinates

1. Deselect the **Coordinate reading on/off** checkbox.
2. Enter (or paste from the clipboard) the coordinate values in the coordinate field.
3. You can now place any point-type object at these coordinates in the following way:
4. On the object form that is created, click **Create** or **Modify** .
5. Click **Center map on the given coordinates** .

Picking the coordinates of an object

You can pick the exact coordinates of an object in the following way:

1. Select the **Coordinate reading on/off** checkbox.
2. Position the mouse pointer over the object. The exact object coordinates are displayed in the coordinate field.
3. Press the space bar on your keyboard to deselect the **Coordinate reading on/off** checkbox.
4. This prevents changes to the coordinate values and you can copy the values to your clipboard.

Changing between coordinate systems

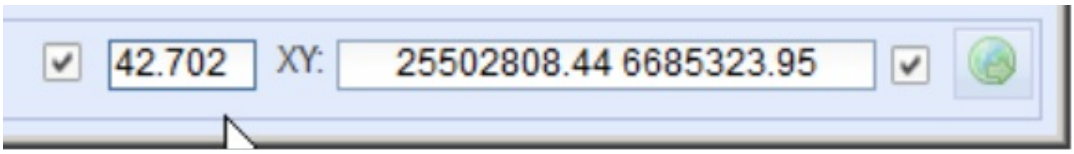
Have the coordinate section display the desired coordinate system by selecting the correct coordinate system from the drop-down menu. The selected coordinate system is used for all functions.

KeyAqua uses a default coordinate system that is displayed in the **Coordinate system** drop-down menu in bold.

Coordinate elevation (Z coordinate)

The **value in the coordinate elevation field** to the left of the coordinate field defines the object elevation when objects are created. If the **Active Z value** checkbox to the left of the elevation field is selected, the field value also defines the coordinate of the new point when snapping to objects. If you want to keep the existing elevation of an object when you edit its location, or if you want to use the elevation of the object you snap to when creating a new one, deselect the **Active Z value** checkbox.

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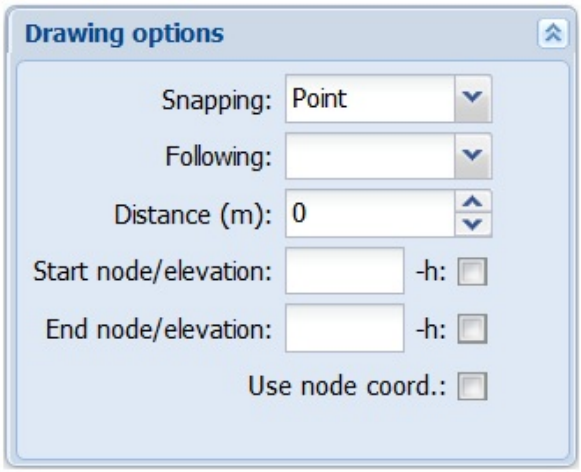
You can find further information on snapping to objects and following in the section Snapping and following (settings for drawing and modifying).

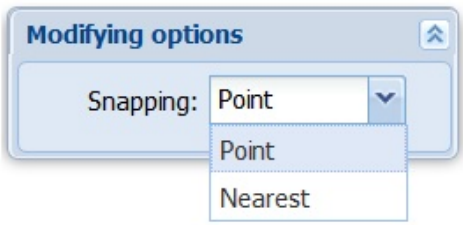
Snapping and following (settings for drawing and modifying)

When you create a new object or modify the geometry of an existing object, you can **snap to** or **follow** an existing object. When you do that, either the **Drawing options** or **Modifying options** form is displayed. This chapter explains how to use the Drawing and Modifying options. The other sections often refer to this chapter, as the basics of drawing and modifying options for map objects are explained in this chapter.

The **Snapping** selection list includes two options: **Point** and **Nearest**. If you select **Point**, you can only snap to the existing points of objects. If you select **Nearest**, you can snap to the nearest point on the next object.

When you digitize a new line object, you can follow the route of another line object if you select either **Completely** or **Partially** from the drop-down menu for **Following**. You can follow an object by double-clicking it in the Object selection pop-up window. If you selected **Completely**, all vertices of the followed object are included in your new object. If you selected **Partially**, you can follow the object for as long as you want. Click on the map to define the point where you want to stop following.





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Change the **Distance (m)** value to follow the route of a line object for the distance you choose. The default distance is 0 metres.

Drawing options and duct elevation

Edit the **Drawing options** to define the elevation of the duct you want to connect to a node. The duct node in question is assigned the value you enter in the **Start node/elevation** and/or **End node/elevation** fields. **An example:** Entering the value **45 m** in the field and snapping to a node that has its bottom at 42 m and its lid at 46 m will result in the connection elevation of the duct being 45 m. In this case, the elevation of the equipment that is connected does not affect the node elevation.

If the **-h** checkbox next to the field is selected, the elevation of the duct node will be determined on the basis of the elevation of the node you want to connect, so that the head of the duct is lower in accordance with the value entered in the field. **An example**: When drawing a duct, enter the value **5** in the **Start node/elevation** field, select the **-h** checkbox and snap to the node with the head of the duct. The elevation of the node's lid is 50 m, which results in the duct's start node having an elevation of 45 m. **Note!** With manholes, the -h distance is compared to the manhole's **lid**, but other equipment, such as valves, only has one elevation value, which is used to determine the elevation.

If you select the **Use node coord.** checkbox, the elevation of the head of the duct will be determined directly in accordance with the node you are connecting. For **a manhole,** the **elevation of its bottom** is used, whereas for other equipment, the node elevation is used. If you do not specify the elevation in the drawing settings, the software will retrieve the node elevation in the following order, as applicable: 1) the **Elevation** fields on the Duct form 2) the **elevation of the node** that you want to connect and 3) **active Z** (see the section Coordinate elevation (Z coordinate). If elevation has not been defined for any of these, the elevation of the duct node will be 0.

Drawing options can only be used to affect the elevation of start and end nodes of new ducts. The elevation of the points of a duct that you draw are always determined based on the current active Z value. If you want to modify the elevation values of an existing duct, the best way is to do so with the tools: Node ducts and elevations and Duct height profile.

Changing scale

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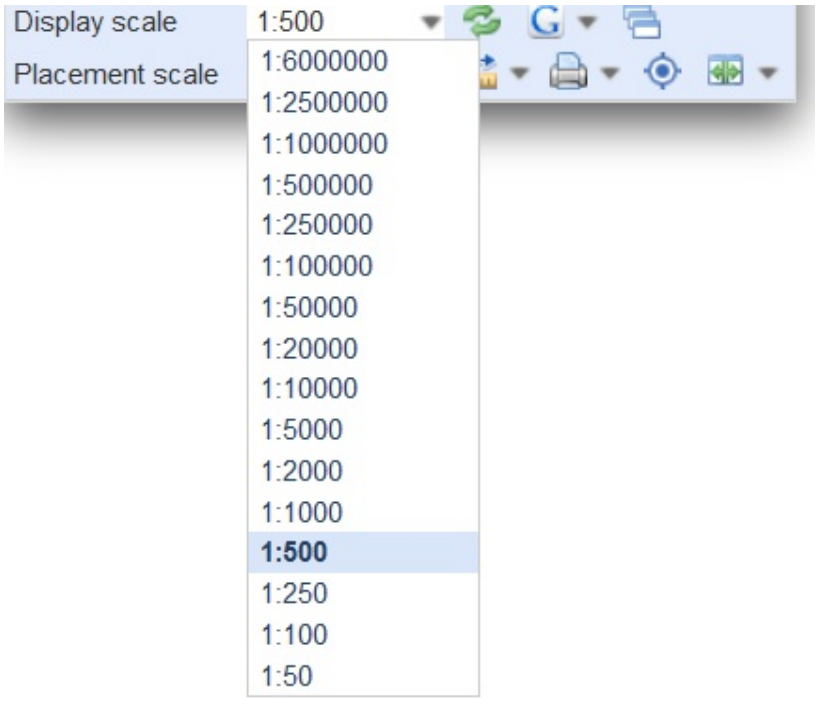
You can zoom the map by clicking **Zoom in** . This zooms the map in while the map center remains the same. Zooming in is carried out one scale level at a time. You can also zoom in using your **mouse wheel**. When you scroll the mouse wheel away from yourself, the map zooms in, and the map center is the mouse pointer's position on the map.

TIP: You can also zoom in on the map by holding down the Shift key and using the left mouse button to select the map area on which you want to zoom in. The map is zoomed in when you release the left mouse button. This is a fast way to zoom in to a larger scale.

You can zoom the map out by clicking **Zoom out** . This zooms the map out while the map center remains the same. Zooming out is carried out one scale level at a time. You can also zoom out by scrolling the **mouse wheel** towards you. The mouse pointer's position on the map is used as the map center.

You can restore the map view to the default view by clicking **Zoom to max extent** . Click **Zoom to area** to define the area that is used for zooming in. Use the left mouse button to define the area on the map. The map is zoomed in when you release the mouse button.

You can select the desired display scale from the **Display scale** menu. The selected scale is displayed in bold letters. The map is automatically updated to the selected scale.



Using the placement scale for new objects

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If you already know, when creating an object, that the **printouts** for the area **will be created using a specific scale**, you can use the placement scale when creating the object. For sparsely populated areas, for example, printouts may be created using a smaller scale than the one used for city areas, and individual objects then may not be clearly visible on the printouts. You can ensure the visibility of objects by using the correct placement scale.

In the **Placement scale menu**, select the scale that will be used for creating printouts. New objects will be created at a size proportional to this scale, and individual objects will thus be visible, for example, in a printout with a 1:2000 scale.

In the example picture, the placement scale and the map symbols are selected with different placement scales (500, 1000, 2000, and 10 000) when the scale of the image is 1:2000.

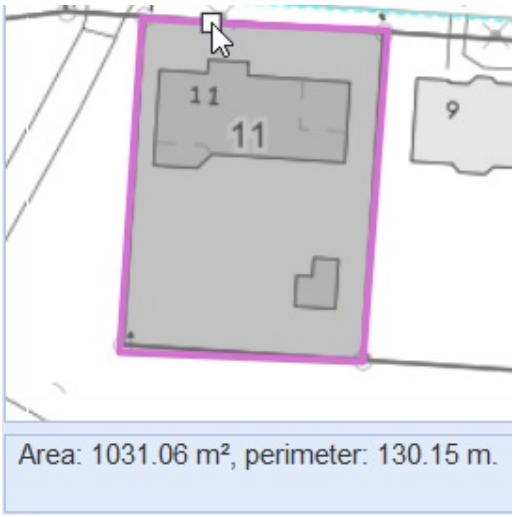


Measuring distance, area size, and perimeter

You can measure distances using the **Distance** tool. Click **Distance** and position the mouse pointer over the starting point on the map to start measuring. Click the **left mouse button** and move your pointer on the map. Enter **points** by clicking the left mouse button. Distance is displayed in the bottom left corner of the screen. The distance information is updated after adding each point. **End** the measuring by **first clicking the left mouse button and then the right mouse button**. Check the total distance.

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Measure the area size and perimeter by selecting **Area size and perimeter** on the **Distance** drop-down menu. Add points on the map to view the area and perimeter information for the polygon formed by the points and the mouse pointer. This area information is displayed in the bottom left corner of the screen. Stop drawing by clicking the right mouse button, and check the complete area size and perimeter information. Click the left mouse button or **Pan** in Map tools to start a new measurement.



Info tool

You can use the **Info** tool to view information on map objects. Click **Info** and then use the left mouse button to click the selected **object shown on the map**. You can only select objects that are visible on the map; in other words, only the activated object layers are available. You can retrieve information on more than one object at the same time. There are several possible ways to retrieve information on multiple objects.

TIP: You can double-click an object on the map using the left mouse button, to view the object's information. The application then displays a separate object form on which the object's information is displayed. If there are multiple objects in the area you double-clicked, they are listed and you can choose the object you want to view.

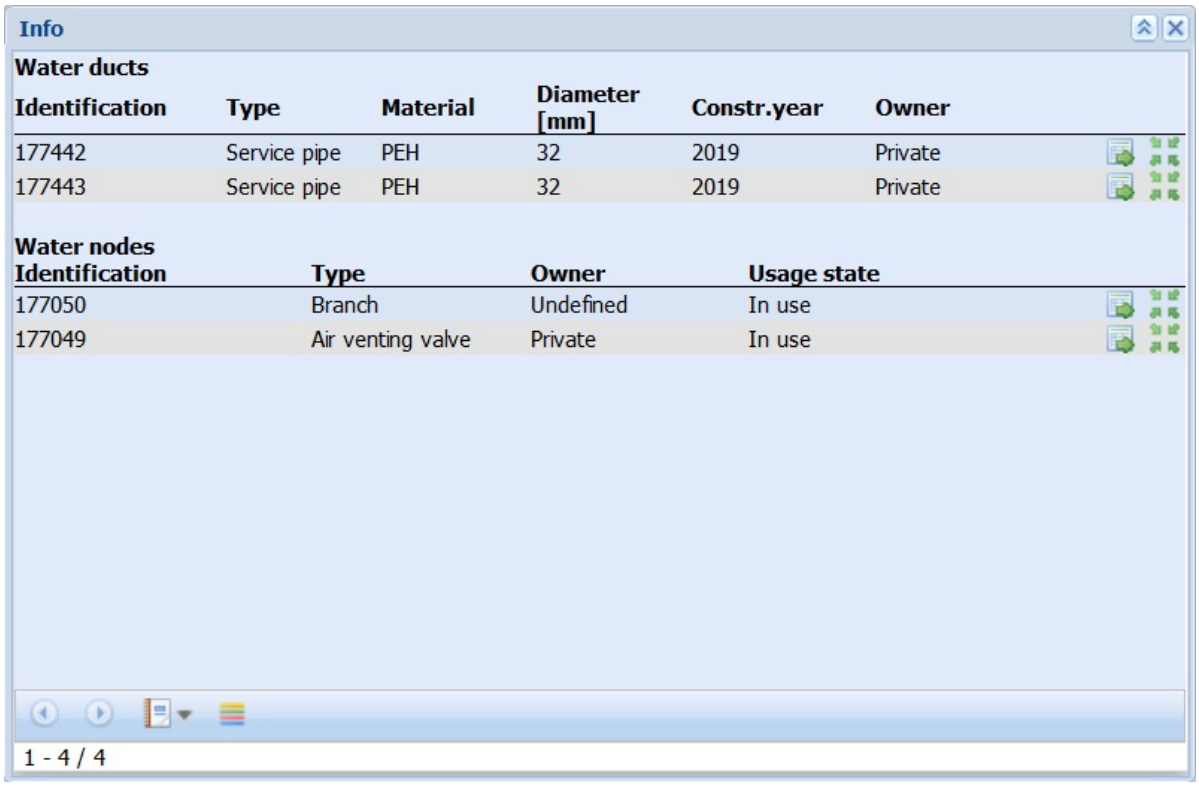
You can define a rectangular area by selecting the area you want by holding down the left mouse button.

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From the drop-down menu next to the **Info** tool, you can select one of the following three functions: **Map view area**, **Free area**, or **Existing area**. When you select **Map view area**, the software retrieves information on all objects currently displayed on the screen. You can use the **Free area** function to define a free-form area on the map.

You can use the **Existing area** function to select an area that has been saved in the system using the **Area** function, and to retrieve the objects in that area.

The query returns an **Info** list in which the **search results are grouped** according to their object type, such as water ducts and sewer nodes. The information displayed is **basic information** on the network objects, such as such as ID, type, owner and usage state. The number of results is displayed at the bottom of the window. If the number of results is large, use the arrow buttons at the bottom of the window to **browse** through them.



Click **Show** to center the map on an object that is highlighted in the map. Click **Edit** to edit an object's information. This button displays an object form that includes the object's detailed property information.

TIP: You can limit your search to specific objects by using object layer selection. For example, in the **Layers** tool, select only the **Water Networks** layer to limit your search to the water supply network.

Exporting data and reporting on map objects

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1. Use the **Info** tool to select objects on the map.
2. Click **Export** to create a **Bill of Materials** for the group of selected objects or, alternatively, to create a location map of the objects in an **external file format**.

View the results of the Info query in a Group display

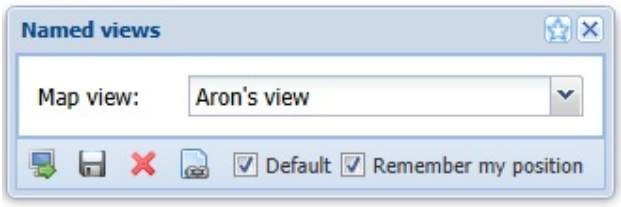
1. Select objects on the map as described above.
2. Click **Show in group display** to view the selected group of objects as **a group of Info tool objects**. The chapter Group display provides further information on the group display.

Map views

You can save the current map view by clicking **Map views** . You can create a new map view using the **Map views** form. You can edit, name, and save map views as necessary, and then return to the map view that you want to view by clicking **Restore view** . You can save several map views and select the map view you need from the drop-down menu. The view you select is then displayed.

Select the **Default** checkbox to define a default map view. The map selected as the default map will be displayed as the initial view the next time you log into the system. When **Remember my position** is selected, the **KeyAqua** application saves the map location, zoom level, and open map layers. The next time you log in, you can continue from where you were the previous time.

You can also copy the map link of the map view by selecting **Copy map link to clipboard** .



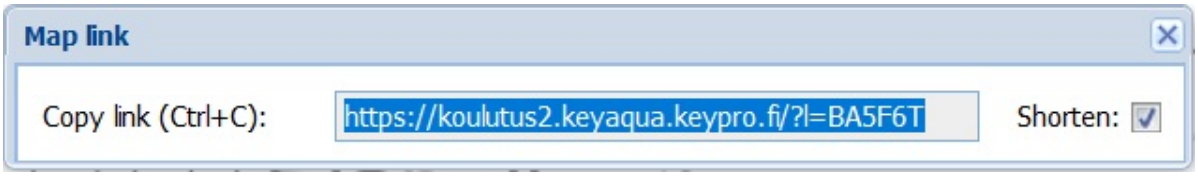
You can also click **Previous view** to return the previous view. This always takes you back to the previous view, one view at a time. Click Next view to go to the next view.

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Map link

Use the **Map link** tool to copy the current map view and send a URL to your colleague or partner company.

1. Click **Map link** in Map tools.
2. Either select the long form or shorten it by selecting the **Shorten** checkbox.
3. Copy the address.
4. Paste it into an email or add it as a browser bookmark.



To return to the view later, copy the address into your browser's address bar or use the bookmark you saved.

Refreshing the map

You can view the changes made to a map by clicking **Refresh map** . This function is useful, for example, when the map data is being updated at the same time **on another workstation**, in which case changes are not necessarily immediately visible in the area that you are viewing.

Google Maps

The services mentioned in this chapter are provided by Google. View the current **map view area** on the **Google Maps™** website: Click **Google Maps** to open a new browser tab to view the current KeyAqua map view on the Google Maps website.

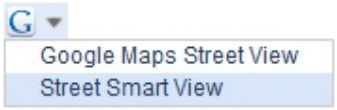
You can view a **street view using the Google Maps Street View™** service:

1. In the **Google Maps** drop-down menu, select **Google Maps Street View**.
2. Point to the road/street location that you want to view and click to open the view in question in Google Maps Street View.

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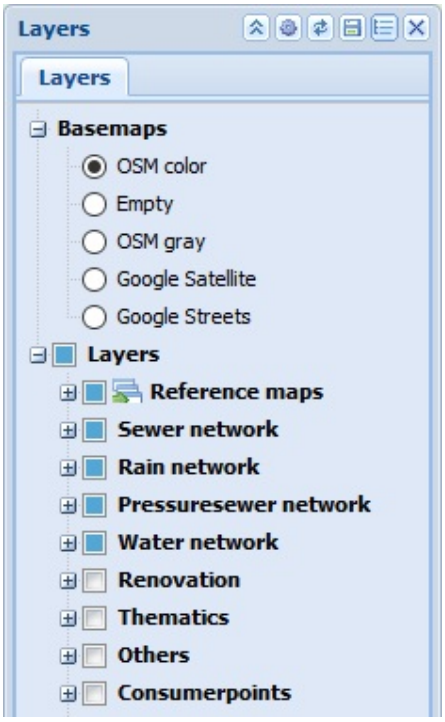
Street Smart View (this function is subject to a separate order)

The **Street Smart View** function in the **Google Maps** drop-down menu provides a 360-degree street view that is true to size. With the street view, you can easily manage street, road, and infrastructure assets. The **BlomStreet** cloud service is an additional feature that is to be deployed separately.



Layers (Layer selection)

You can select the background map and network object layers using the **Layers** tool. Click **Layers** in the Map tools to view the list of objects. The available map layers depend on the customer and what has been agreed concerning the available maps.



You can minimise or maximise the **Layers** tool by clicking the arrow at the top of the form. You can close the form by clicking the cross. You can hide the lists of background maps and lists of object layers by clicking in front of the row, and you can expand them by clicking .

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Selecting the background map

The default map is one of the available maps. You can also select some other map as the **default map,** or you can select the option **Empty**, in which case no background map is displayed. Only **one map at a time** can be selected as the background map. The background map helps users understand where the network objects are located, and this map cannot be modified.

Object layers

The **network object layers** available for selection are listed under object layers. You can select **multiple** layers to be shown **at the same time.** If an object layer is not selected, its objects are not displayed on the map and it is therefore not possible, for example, to pick them from the map for forms. **You should select, at a minimum, those layers that have objects you want to view or edit.**

The object layers available for selection include the network objects (ducts and nodes) and the annotations and reports related to them. In addition, you can choose to have renovations, themes, free objects such as lines and texts, addresses, surveys, and other objects available in the layer selection list to be displayed on the map.

The **checkbox**  to the left of an object's name indicates whether the object has been selected. You can remove or add an object by clicking its checkbox. You do not need to refresh the map afterwards as your selections are applied automatically. If you want to activate all layers at once, select the checkbox for the highest layer (**Layers**).

The number of objects visible on the map is proportional to the speed with which the map is refreshed. For this reason, we recommend that you only select the layers you need to view on the map.

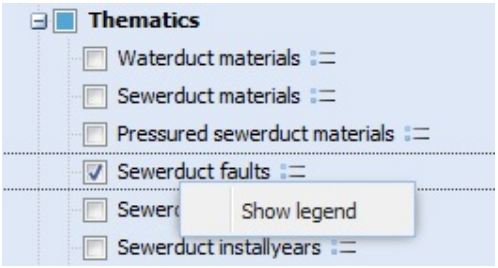
Sub-layers of the layer hierarchy (a function subject to a separate order)

The layer hierarchy can be created on the basis of the object's attribute data. For example, the lower layers of a district heating network could be heating and cooling. The creation of environment-specific sub-layers is possible through a function that is subject to a separate order.

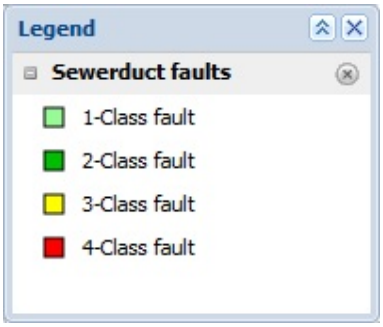
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Thematics

The various map objects can be shown on the map according to different property attributes. Themes highlight objects on the map, for example, based on network usage state or technology. To display theme legends, use the left mouse button to click **Show legend** next to the name of the theme or click the right mouse button and select **Show Legend** on the displayed menu. If a legend is not available, the button and the menu item are hidden.



The **Legend** window that is displayed explains the theme colours and the related legends, such as sewer duct fault classification.



The **Legend** list works in a manner similar to stacks: when a new legend or theme is selected in the layer selection, a new group is added on top of the list. You can expand or minimize groups by clicking and or by double-clicking the group header. You can hide a group by clicking .

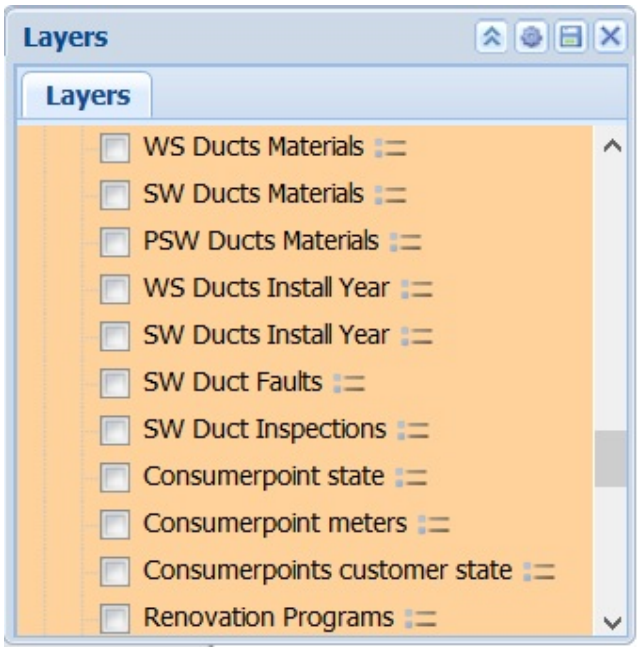
Configuring object layers

You can configure the layers into separate groups using the application user interface. You can group similar layers into one group, for example, group all KeyAqua objects under

one layer, thus making it possible to view or hide them with a single click. Only users with administrator rights can configure the layers using **Configure** .

On the **Layers** form, click **Configure** at the top to group object layers. You can configure layers when the background colour of the form changes to orange.

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Use your mouse to drag layers to a new location on the list. For example, you can move the **WS Ducts** layer to the **Sewer network** group by grabbing the **WS Ducts** layer with the left mouse button and dragging it to the top of the **Sewer network** group.

You can move layers that you do not use and hide them in the **Ungrouped layers** group. This **Ungrouped layers** group appears at the end of the list when the layer configuration function is activated.

Layer configurations

You can save a **Layer configuration**, that is, the selected background map and the active layers, by clicking **Save** in the top-right corner of the Layers tool. Layer configurations are saved in the browser cache, and therefore they are not available on other computers.

Layer configurations can also be saved in a **database** with a user name, in which case the layer configuration is user-specific instead of browser-specific. Save a layer configuration in a database by clicking **Configure** , and wait for the background colour to change to orange. Click **Save** to save the layer configuration in a database.

Upload the saved layer configuration to the **Layers** form by clicking **Reload** . You can restore the original layer configuration settings by clicking **Reset to defaults** .

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Layer filters

Layer filters are used for limiting the number of objects shown on the map. Objects can be filtered based on **usage state** and **plan**. When filters are used, only the objects selected on the filter form are visible on the map.

Active filters are marked in the layer selection list: A filtered layer is marked with a highlighted filter symbol . When a filter is not selected, the icon is not highlighted .

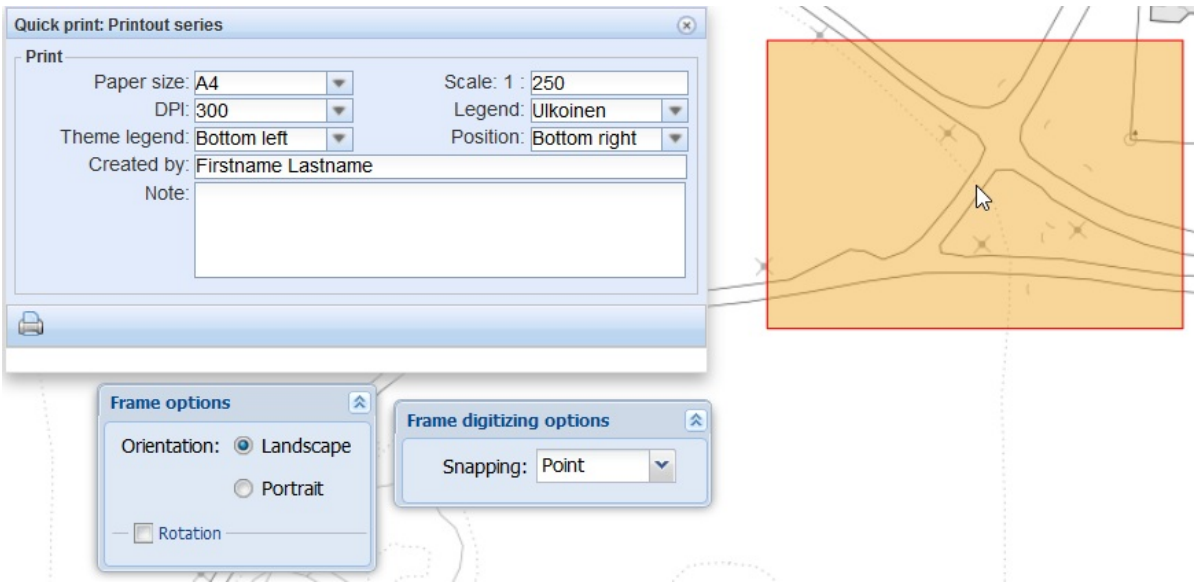
Printing

Use the **Print** tool for **print series** and **quick print**. **Print series** refers to printouts that consist of one or several parts, whereas **quick print** enables you to quickly create a printout of the map.

Quick print

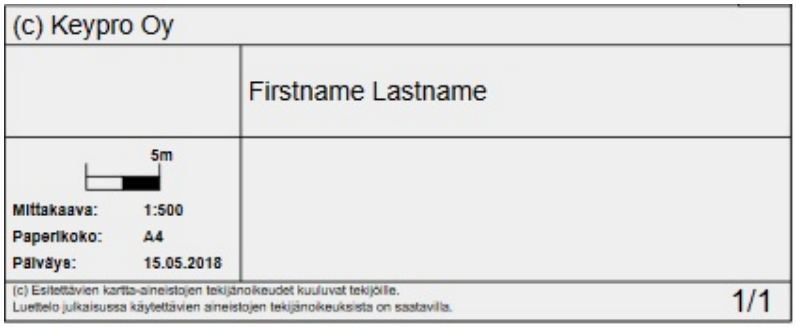
In the Map tools bar, click **Quick print** to access the **Quick print** function. In print settings, you can define settings related to paper size and the display settings for the detailed information to be included in the printout.

Start quick print by filling in the form. The form fields Paper size and DPI must be completed to match the paper and printer you are going to use. Paper size means the physical size of the printing paper. In the **Scale 1:** field, enter the size of the print area as a scale proportion. When the display scale is 1:500, and the same scale is applied to the printout, the printout proportions are the same as in the map view.



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You can include a print legend (**Legend**) and a **Theme legend** on the printout. You can also define their **location** on the printout. The **Print legend** refers to the map legend, which includes information on the paper type, scale, person creating the printout, and date of printing. You can add your own text in the **Note** field.



You can include a **Theme legend** on the printout by going to the **Layers** list and activating those theme levels that you want to include. In the drop-down menu for the theme legend, select the location of the legend. The **Theme legend** on the printout will include the same information as the **Themes** – **Show legend** window.

The borders of the print area (the frame limits) move with the mouse pointer. When you click Quick print, the **Frame digitizing options** and **Frame options** selections are displayed. In **Frame digitizing options**, you can select the snapping point of the movable printing frame by moving it while holding down the SHIFT key. Select **Point** for snapping if you want to move the point to the same location as an existing point. Select **Nearest** for snapping if you want to position the point on top of a line object. This moves the point to the nearest snapping point on the closest line object.

In the **Frame options** window, you can modify the orientation and rotation of the print area on the page. The changes you make are applied immediately to the frame shown on the map.

Use the left mouse button to select the desired location of the frame and print it using the right mouse button, or click **Print** on the form to have the browser provide the file in PDF format for downloading.

To relocate the frame, use your left mouse button to point at the red square in the middle of the frame and, while holding the button down, drag the frame to the location you want. Click **Print** to print.

TIP: Depending on your browser settings, you may see a notification that the page is trying to open a pop-up window after approving the printout. You must allow pop-up windows in order to enable printing.

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Print series

The difference between **print series** and quick print is that a print series consists of several map printouts (frames). The first page of a **print series** includes an index map showing all the map printouts, and it provides an overview of the individual frames with their numbers and locations. This feature helps to locate the various series printouts on the map. Activate the **Print series** function in the **Print** drop-down menu .

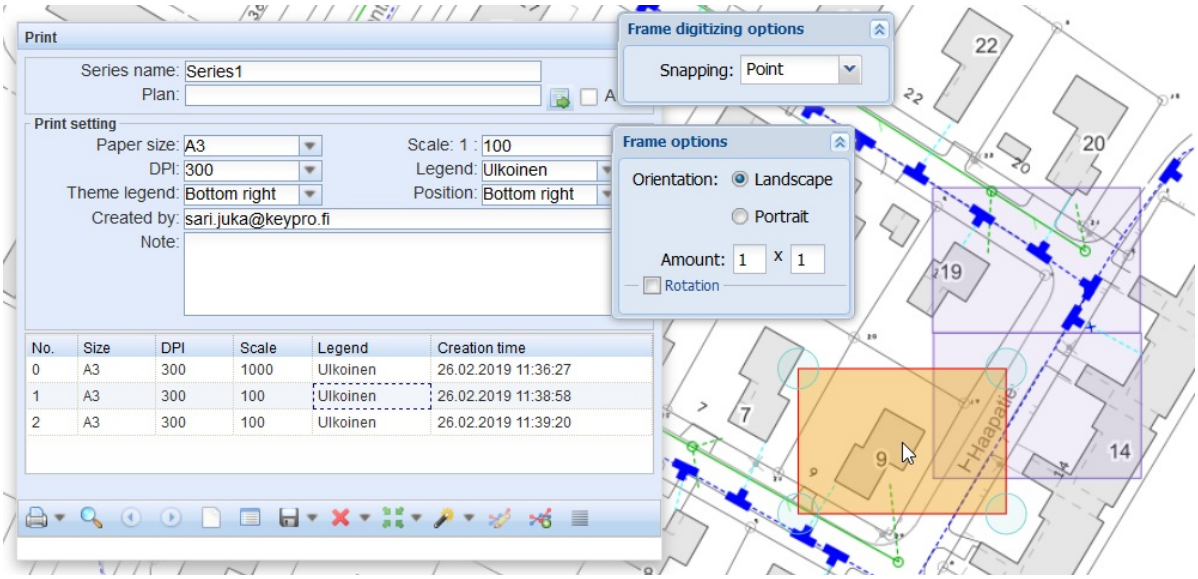
The **Print series** form includes fields for settings and a field for the printouts (frames). The first row of the **list of frames** is always the title page, and the actual frames are listed below it. The settings information displayed in the form's fields is related to the frame that is active in the list of frames. You can edit and save printout-specific information. You can also create printouts of single frames.

Fill in the form fields as described for Quick print. After this, click **Save form** to activate the creation of frames. Click **Create** to start creating map frames. The borders of the print area (frame) move along with the mouse until you select the map location you want by clicking the left mouse button. When you create a print series, the **Frame options** and **Frame digitizing options** are also displayed. Please see the chapter **Quick print** for more details on these.

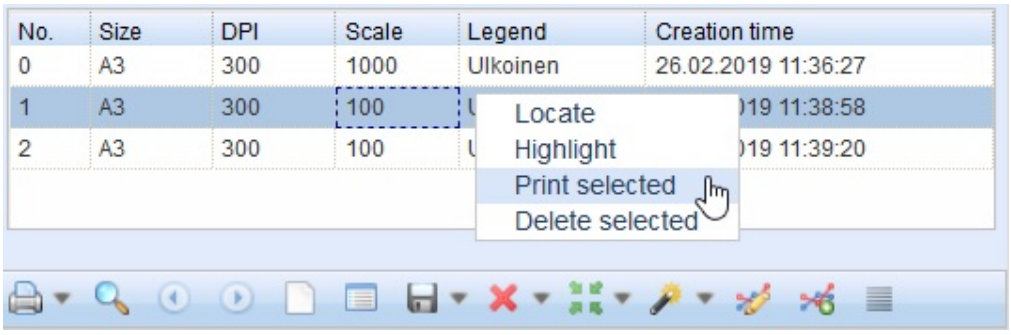
Click the right mouse button to accept a frame. A new printout line is added to the list of frames on the form. The number of frames is not limited. You can also edit the settings for each frame; for example, you can modify the scale of the printout.

In the figure, two frames (blue rectangles) have already been added to the map and it is about to be grabbed with a two-frame matrix (the orange rectangle with blue circles in the corners.

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You can download the **Print series** in PDF format by clicking the **Print** button on the form. The browser will provide a PDF file for download, and this file includes the entire print series. **Print a single frame** by selecting **Print selected** in the drop-down menu for the **Print** button. The frame selected in the list of frames is printed. Alternatively, you can print a frame by clicking a frame on the Print form using the right mouse button and selecting **Print selected**. The menu also includes options for locating, highlighting, and deleting a frame.



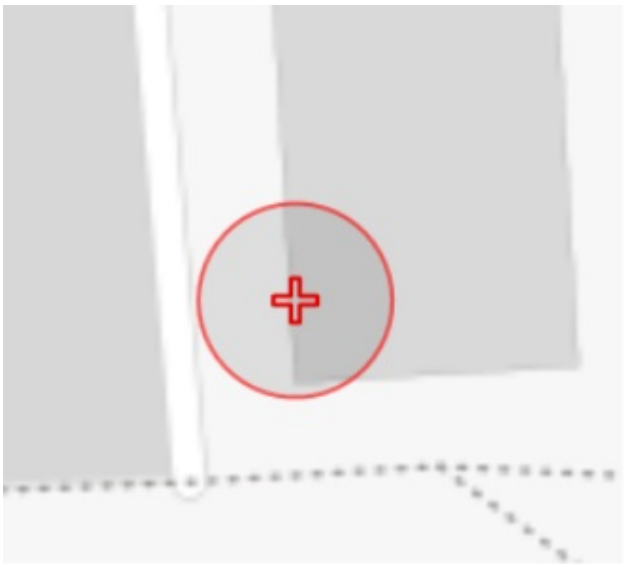
You can also use the **Quick print** function on the **Print series** form. The drop-down menu for the **Print** button includes the option **Quick print**.

TIP: The print series are stored in the database until they are deleted. This lets you print the same series later.

Locating yourself

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The **Locate** tool enables you to center the map based on the location of your equipment. Depending on the functions of your equipment, your location can be based on, for example, GPS coordinates or the location information obtained from a wireless or fixed network. Centering the map based on the network location information may be extremely inaccurate. A cross symbolising the location and a circle representing the margin of error are shown on the map.

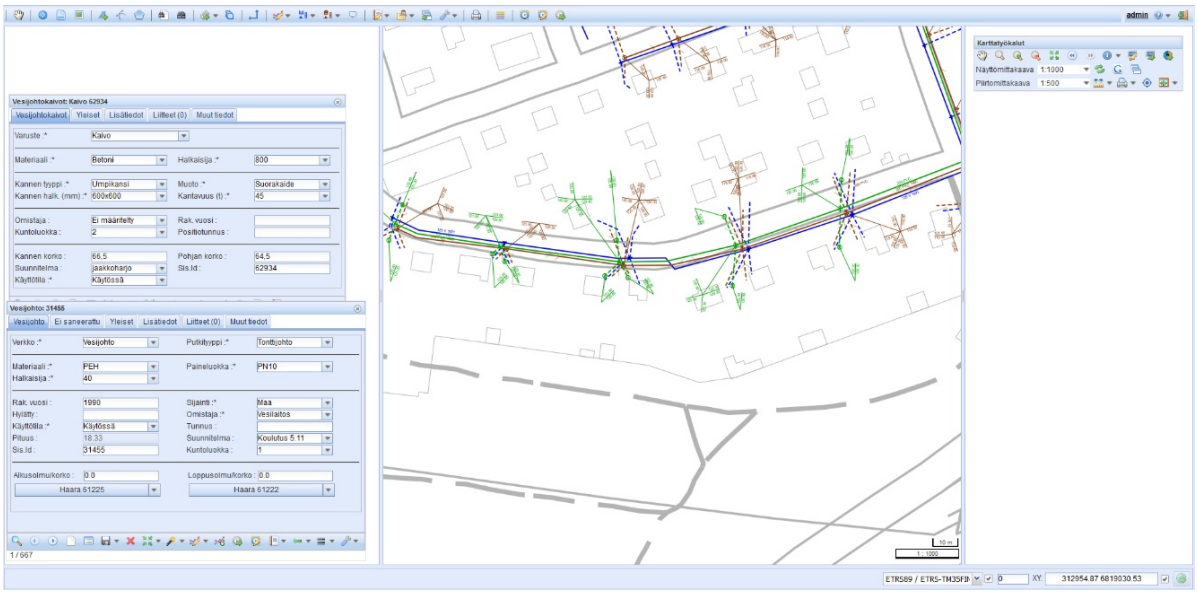


The **Locate** feature allows you to center the map on either the location of your GPS signal, or based on your network location. Centering the map based on the network location information may be extremely inaccurate.

Splitting your display

With the **Split map** tool, you can split your display into two or three sections to view the map in one section and the forms in others, so that they are not on top of the map. Use the tool options to select whether you want to have the new display section on the left or right side of the map view, or on both sides. You can deactivate the Split map function using the **Cancel** command in the tool.

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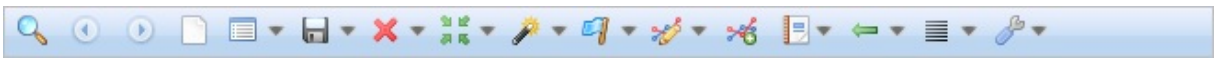
TIP: This is a very useful tool if you are using more than one monitor!

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GENERAL FUNCTIONS OF THE OBJECT FORMS

All object forms used for managing objects and events have the **same structure and functions**. Only the **information included** on the object forms varies somewhat depending on the object form. For this reason, each object form can only be used for managing the specific object related to the object form. For example, the Fireplugs form is used for fireplugs and the Sewer nodes form is used for sewer nodes.

The functions of the buttons displayed at the bottom of object forms are always the same even though the information content of the forms may vary. In other words, the **buttons always function in the same way** for all network objects and on all forms. The buttons that are displayed **depend on the user's privileges**. For example, read-only users cannot update information. If a button is dimmed, it is currently unavailable. The button functions are introduced in the next chapters.



In addition to the buttons displayed at the bottom of an object form, some object forms contain **additional functions** that are also used in the same way on all forms. These functions are used, for example, to add dates and address information and to add Duct and Node information on the Events form. These functions are discussed in the following chapters: Events, Entering a date and time and Managing address and apartment information on object forms. **The functions of buttons that are not introduced in this chapter are discussed in connection with the relevant object forms.**

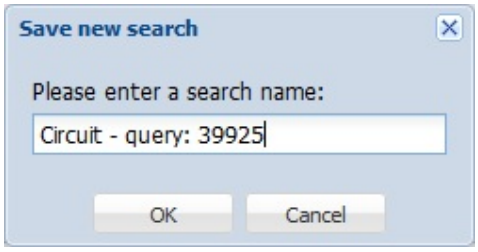
Favorite tools

Click **Favorite** in the top-right corner of the form to define the form in question as a favorite. User-defined **favorites** are displayed in the toolbar at the bottom of the map view, from where you can open them quickly. Future version updates may affect your settings concerning your favorites.

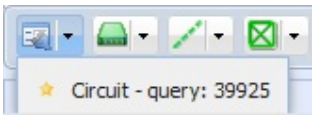
You can also save the form's search results as favorites:

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1. Retrieve the required information to the form, as instructed in the Retrieving information to a form and Picking objects from the map chapters.
2. Click the **Favorite** button.
3. You can enter a name for the search results in the **Save new search** dialogue box.



4. Click **OK**.
5. Your search results are now saved in the **Favorites** toolbar.



Deleting favorites:

Clear the form that you want to remove from your favorites. Click the **Favorites** button at the top. The program will ask you to confirm the deletion of the favorite.

OR:

Right-click the favorite in the bar at the bottom. The program will ask you to confirm the deletion of the favorite.

Note! By deleting the favorite, you delete the search result queries associated with the favorite.

Retrieving information to a form

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To retrieve data on all objects to the form, first click to clear the form and then click **Search** . If you want to retrieve data on some specific object types, you can define the **search criteria** that are applied to your search. For example, if you want to find information on all water ducts built in some specific year, enter the year in the **Constr. yr** field on the **Water duct** form and click **Search** . **The number of search results** is displayed in the bottom left corner of the object form. If there is more than one result, you can **browse** through them with the arrows . You can enter values in any fields on the form or use a combination of fields to search for objects. If you want to browse through a large number of search results and update information related to some individual search result, the easiest way to do this is to use the **List** function (List view).

TIP: You can use **%** as a wildcard character to substitute text when carrying out a search. For example, instead of **First Avenue**, enter **Firs%** in the **Address** field to include all addresses starting with **Firs** in the search results. If you enter the character **!** in a field, the search returns objects with no information in that specific field.

There is an **Internal ID** field on each object form. Internal ID refers to the internal ID of each object. These IDs are automatically generated for each new object and they cannot be changed. This feature ensures that internal IDs are good identifiers because, based on the internal ID, the user can be sure that an object is definitely the same even if its property attributes have been changed. You can use the internal ID as a search criterion when searching for an object.

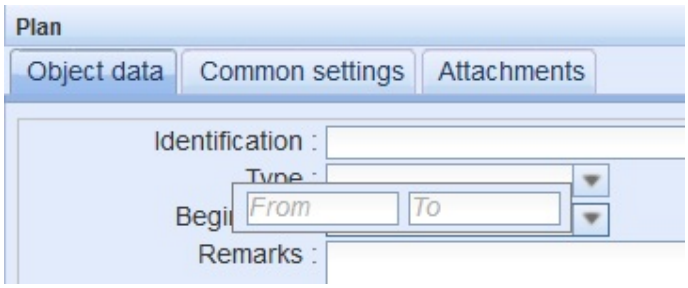
Selecting multiple items

Some forms provide the option to select multiple items for searching. For example, the **Plan** form allows searching for multiple items based on values defined in the **Type** field. Hold the **Ctrl** key down and use the right mouse button to select the values in the **Type** field menu that you want to use as search criteria.

Searching by a date or number range

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On some forms, you can search by a date or number range by double-clicking the field for a date or numeric value. When this function is activated, the original date field (or the field for a numeric value) is replaced with two new fields: the start and end values. Enter the relevant search criteria in these fields. When you click **Search** on the object form, all objects with their date (or numeric value) within the entered start and end values (including the entered values) are returned as search results.



Clearing an object form's fields

You can clear the data in object form fields by clicking **Clear** . This function clears the data in the fields, but it **does not delete the data from the system**. Clear the object form fields before conducting a new search, for example. When you click **Clear**, data on all searched objects for that form is deleted, not only the data related to the object that was displayed on the form. Any highlighting on the map is also removed.

Default form values

You can view the default values for the object form fields by clicking **Defaults** . Values are displayed if they have been entered in the system. Default values can include, for example, the most common property data for an object. Admin users can modify default values. When you add a new object, you can use the **Default** function to speed up the process of entering property values. You can also apply default values when you search a database.

Object template catalogs

You can also save the values entered in the object form fields and apply them later by selecting a saved template from the **Defaults** drop-down menu under **Template Catalogs**.

1. First, fill the desired object form fields.

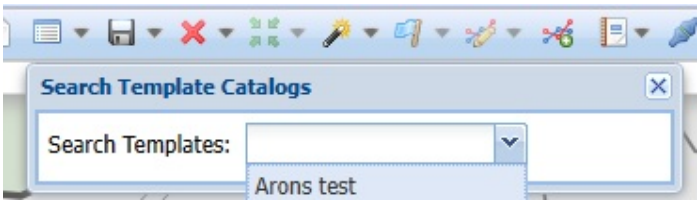
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2. Then, click **Save as Catalog** and enter a name for the catalog. If the name already exist, the system asks to update the existing catalog.



3. Click **Save Catalog.**

Your template is now saved and can be accessed anytime from the **Defaults** drop-down menu by selecting the correct template.

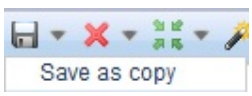


Updating object data

You can edit an object's information on the form and update the information by clicking **Save** . For example, if you want to modify the usage state of a water node and add information about the construction year, take the following steps: Open the required water node on the **Water nodes** form, go to the **Usage state** menu and select **In use**. Then enter, for example, **2017** in the **Constr. yr** field. Click **Save** .

Copying an object as a new object

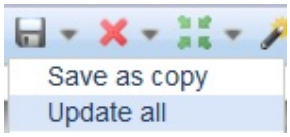
The **Save as copy** function is available in the drop-down for **Save** . This function creates a new object by using the same property values and location. We recommend using this function, for example, when the intention is to digitize several objects with the same information in the same place.



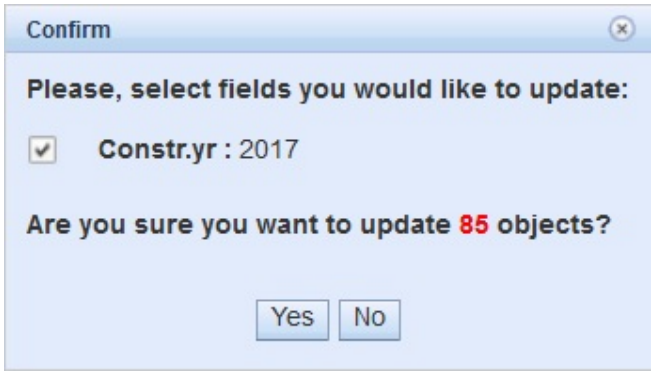
Mass update (Update all tool)

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The **Update all** function is available in the drop-down menu for **Save** . With Mass update, you can update data for multiple objects at one go. This function is useful in many situations when multiple objects need to be modified simultaneously.



For example, if you want to update the year 2017 as the construction year for all water ducts in the area, first retrieve information on all the water ducts in the area in question (area search) to the **Water duct** form and enter **2017** as the value for **Constr. yr.** Then, in the drop-down menu for **Save form**, click **Update all**.



On the **Confirm** form, select the information that is to be updated for the objects if you have modified more than one form field. Click **Yes to update 2017 as the construction year of the objects** retrieved to the form.

Deleting objects

To **delete objects from the system**, retrieve an object through the form and click **Delete** to open the **Confirm** dialogue box. The following dialogue box is displayed: **Are you sure you want to delete this object?** Click **Yes** to delete the object. This deletes both the property and location data of the object from the system. In other words, the object is no longer visible on the map and its information is deleted from the database.

You can find an object for deletion by defining search criteria and by clicking **Search** if you have knowledge of some key property value, such as **Identification**. If you know the location of the object, you can pick the object data from the map with the **Pick** function.

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Locating and highlighting an object

Objects on the form can be **located on the map** by clicking **Locate** . The map is centered on the object that is **highlighted** on the map. Objects can be located if an object's geometry has been stored in the system and it is within the permitted coordinates.



The drop-down menu for **Locate** also includes the following options: **Zoom**, **Highlight**, **Zoom to all**, **Highlight all**. These functions are introduced next.

- The **Zoom** selection centers the map on the active object on the form. (Displayed only for objects that have a location.)
- The **Highlight** selection highlights the active object on the map, but the map view does not change. (Displayed only for objects that have a location.)
- The **Zoom to all** selection centers the map so that all objects retrieved to the form fit the map view.
- The **Highlight all** selection highlights all objects downloaded on the form, without changing the map view.

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Picking objects from the map

To pick objects from the map first click **Pick** and then use the **left mouse button to point at the map objects**. The object's information is displayed on the form. You can only pick **objects relevant for the form in question**, that is, if you try to pick pick a water valve to a form for sewer ducts, the following text is displayed at the bottom of the form: **No matches found.** If you are not sure which object is in question, you can use the **Info** tool to define the object and then open the correct form for that object from the list of results.

TIP: If you want to view the information related to an object whose type you do not know, you can use the **Info** tool. In the Info window that is displayed, click Edit to access the object's form. The use of the Info tool is discussed in more detail in the Info tool chapter.

Area searches

The **Free area** function is used to limit the required shape of the search area. You can pick the **data for multiple objects** at once. Click **Pick** . Use the left mouse button to point at the starting point and hold down the mouse button until you have marked the area you want by drawing a rectangular. When you release the left mouse button, the information in the selected area is displayed on the form.

You can also select an area using the functions available in the drop-down menu for **Pick** . **Map view area** retrieves the information on all objects in the map view. You can use the **Free area** function to select the **required free-form area** by placing **points** in required locations using the left mouse button. End the area selection by first clicking the left mouse button and then the right one. The search area is the area within the points you marked on the map.

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With the **Existing area** function, you can select a map area that has been created with the **Area** tool (Area, Plan), in which case the search will be carried out within the selected area.

If the object form fields are empty when the search is carried out, the search results include all the objects for the form type. You can use **search criteria** to limit the search results. Enter the search criteria in the fields of the form and click **Pick** . You can then select the **Pick from map** checkbox in the dialogue window that is displayed. Carry out a search as described above for area search functions.

For example, if you want to view the information on all water ducts installed in 2017 in a specific area, enter the search criteria on the **Water duct** form, that is, enter **2017** in the **Constr. yr** field. After you have defined the search area on the map, the number of search results is displayed in the bottom left corner of the object form. Use the arrow buttons to browse through the search results.

Modifying the geometry of an object

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You can modify the geometry of the object on the form, that is, you can edit its location and form by clicking **Modify** . A **Modifying dialogue** is displayed, in which you can select various settings related to modifying the object's geometry. Click **Save form** to update the modified geometry and other form fields.

Modification settings

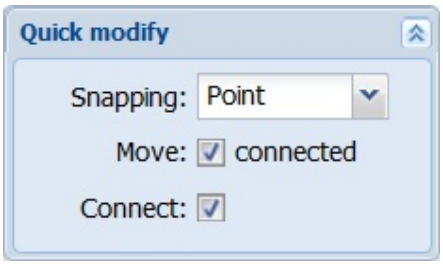
In the settings for geometry, you can select the snapping point applied to a point if it is moved while holding down the **SHIFT** key. Select **Point** for snapping if you want to move the point to the same location as some other point. Use **Nearest** if you want to position a point on top of the line of a line object, meaning the point moves to the nearest point on the nearest straight line.

Modifying the geometry of a line object

Line objects can be modified on the **Duct** and **Line** forms. Select a line object on the map and open its form. Select **Modify** to activate the function for modifying the geometry of the object. Alternatively, you can click on a line object on the map to use the **Quick modify** function.

Quick modify function of a line object

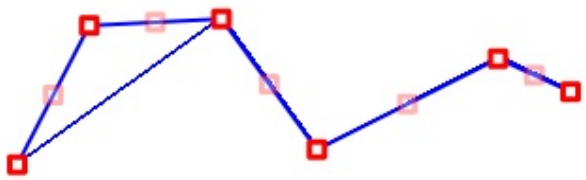
1. Point at the required line object on the map and click the **right mouse button** while holding down the **Control** key. If the map object includes multiple objects, the **Object selection** window will be displayed. Click the required object with the right mouse button and select **Modify** .
2. Select the required options in the displayed **Quick modify** dialogue box.



1. **Drag** the points highlighted in red to the required location or **remove** them with the **Delete** key. You can snap to another object by holding down the Shift key while releasing the left mouse button.
2. Click the right mouse button and click **Save** in the **Confirm move**

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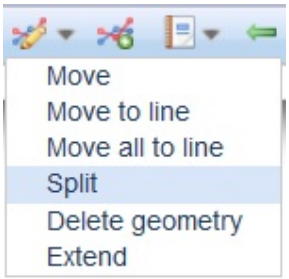
window to save the changes. Cancel the changes by using the **Cancel** function.



The original points of **a line object**, such as a cable, are shown as **dark red** squares on the object. You can use the pink squares to add points. Moving squares: When you place your mouse pointer **over a point**, the mouse pointer icon changes to indicate that the point can be moved. Click the **left mouse button** to **grab and drag** a point while holding down the left mouse button. The point moves to the location where you release the mouse button. Click **Save form** to save the new location information.

Splitting a line object

The **Split** tool is displayed in the drop-down menu for **Modify** . Line objects can be split using the **Split** function. This function highlights the selected object on the map and displays the **Splitting** dialogue box. This dialogue box displays the **lengths** of the parts to be split. These lengths are automatically updated based on the selected splitting point. The **Delete annotation** selection is used to automatically remove from the map any annotations related to the object.



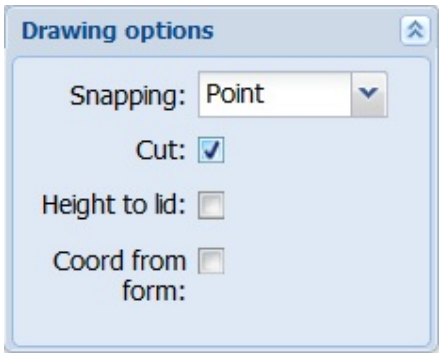
Select the point where you want to split the object and click the left mouse button to accept the split. Both objects created through splitting are now displayed on the form. Use the arrow buttons to browse through the objects.

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The **Cut** and **Coord from form** are options in the node's **Drawing options**:

- The **Cut** tool will not create any nodes (such as valves or branches) at the duct's cut-off point. In addition, ducts can be split when nodes are being placed. **When you are placing a node**, you can select **Cut** in the **Drawing options**. To select the duct that you want to cut, click the duct while holding down the **SHIFT** key and point at the position of the node on the duct.
- The elevation of the node will be determined based on the elevation of the cut-off point. An exception to this is a situation in which the **Coord from form** option is activated, in which case the elevation entered on the node's form will be used.

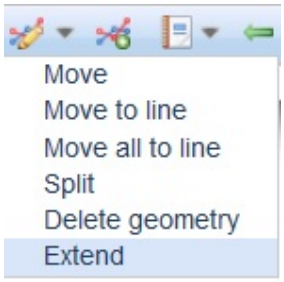


- It is possible to select **Height to lid** option, which takes the elevation of the snapped item to lid.

Extending a line object

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A line object (ducts, lines) can be extended from the end that has not been connected. Activate this function in the drop-down menu for **Modify** . The **Drawing options** dialogue is also displayed. The functions of the **Drawing options** dialogue are described in the chapter Snapping and following (settings for drawing and modifying).



To continue the digitization of the object from its end point, create new **points** in the required locations using the left mouse button. Create the **end point** of the object by **first clicking the left mouse button and then the right mouse button**. The object's location and property values are automatically saved in the database.

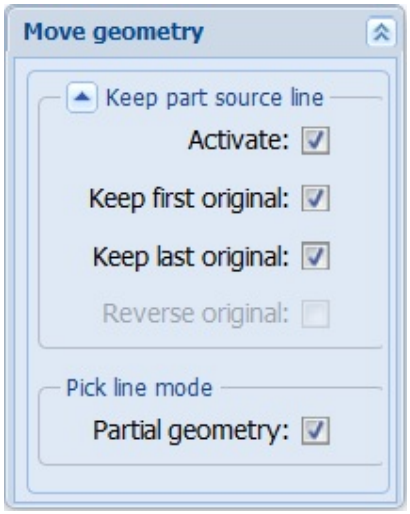
Moving a line object to a line

You can move a line object to match the location of a geometry with a survey line string, duct or other line object.

1. In the drop-down menu for the **Modify** function on the form, select **Move to line**.
2. Select the required options in the displayed **Move to line**dialogue box:
    - **Activate**: With this option, you can maintain a part of the line's original location, while another part is moved to a new target line. Activate the additional functions for the line that is to be moved:
    - **Keep first original**: Keeps the first part of the line unchanged up to the point where you click the line
    - **Keep last original**: Keeps the last part of the line unchanged from the point where you click the line
    - **Reverse original**: Reverses the order of the start and end points of the line to be moved. You can activate this function when you first select the start and end points on both the line that you want to move and the target line.
    - **Pick line mode**: **Partial geometry**: You can choose a part of a

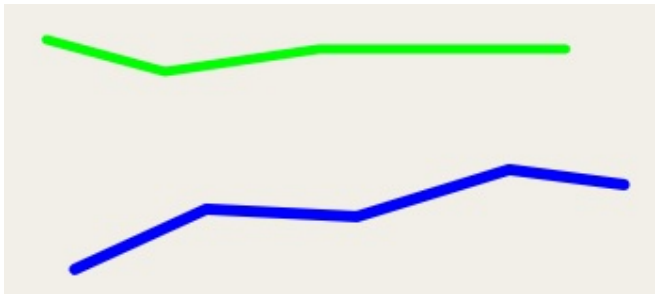
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route on both lines: the one you want to move and the target line.



1. With the left mouse button, **point** at the line to which you want to move an object.
2. **Stop** the line selection by clicking the right mouse button. The new location of the object to be moved is highlighted in green.
3. **Accept** the object move by clicking **Save** on the form, or cancel the move by clicking on **Clear**.

The blue line is the line that the user wants to move. The thicker green line represents the new location of the object that is moved. The purple line means that the move has been accepted with the **Save** button.



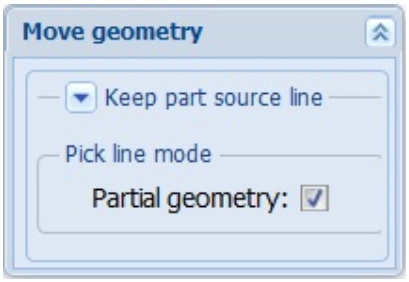


Moving a line object partially to a line

1. In the drop-down menu for the **Modify** function on the form, select **Move to line**.

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2. In the **Move to line** dialogue box, select the **Partial geometry** checkbox.



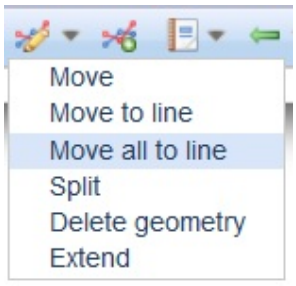
3. On the map, use the left mouse button to point at the target object (line, duct) on the map.
4. Select the starting point on the target line.
5. Select the end point on the target line.
6. Repeat items 3–5 if you want the object to follow more than one line.
7. Stop the line selection by clicking the right mouse button. The new location of the object to be moved is highlighted in green.
8. Accept the object move with **Save form** or reject it with the **Pan** button.

In the exampe figure below, the line that will be moved is at the bottom, and above are the two lines to which it will be moved. The starting point is displayed as a blue square, while the real-time location is displayed as a light blue circle. The green line represents the future location of the line.



Mass movement of line objects

In the drop-down menu for the form's **Modify** function, select **Move all to line** to activate a mass transfer. Note that more than one line object must be retrieved to the form to make mass movement possible. Take the same actions as when moving a line object, as explained in the chapters Moving a line object to a line and Moving a line object partially to a line.

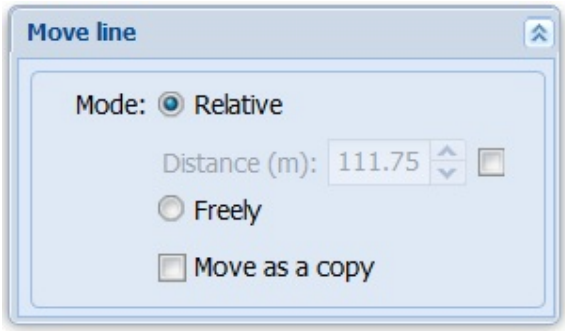


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Moving a line object

You can move a line object on the map either freely by dragging it using the left mouse button or relatively by defining the distance from the original location.

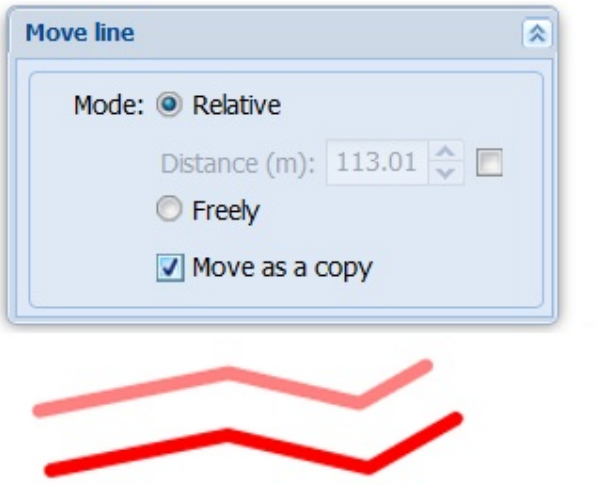
On the object form, in the drop-down menu for the **Modify** function, select **Move**. The object is highlighted on the map and a **Move** dialogue box is displayed, in which you can select the **Mode** of movement.



Select **Relative** to move an object horizontally or vertically for the number of metres displayed in the **Distance** field. Click the left mouse button to accept the location, and click **Save form** to save it.

Select **Freely** to move an object by positioning your mouse pointer **over the red square** and **move** the object to a new location **while holding down the left mouse button**. Release the left mouse button. Click **Save form** on the form to save the new location information.

Selecting the **Move as a copy** checkbox makes it possible to copy the object to a new location. A copy of an object is highlighted. Use the left mouse button to confirm the location of the copy.



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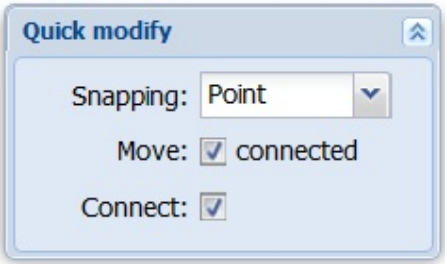
Modifying the geometry of a point object

Modifying the location of a **point object**, such as a node, is carried out in the same way as for line objects, the only difference being that there is only one point. Click **Modify** to highlight the modified object in red on the map. When you position your mouse **over the object**, the mouse pointer changes from an arrow to a cross. Click the object with the left mouse button and **hold the button down** while moving the object to a new location. Release the mouse button. Click **Save form** to save changes. When you click the **Modify** button, the **Modifying options** dialogue box opens (Modifying options).

The quick modify function of a point object

Point at the required point object on the map and click the **right mouse button** while holding down the **Control** key. If the map object includes multiple objects, the Object selection window will be displayed. Click the required object with the right mouse button and select **Modify** .

Select the required options in the displayed **Quick modify** dialogue box.

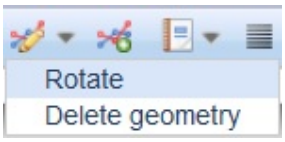


Drag the red square to the required location. You can snap to another object by holding down the Shift key while releasing the left mouse button.

Click the right mouse button and click **Save** in the **Confirm the move** window to **Save** the changes. Cancel the changes by using the **Cancel** function.

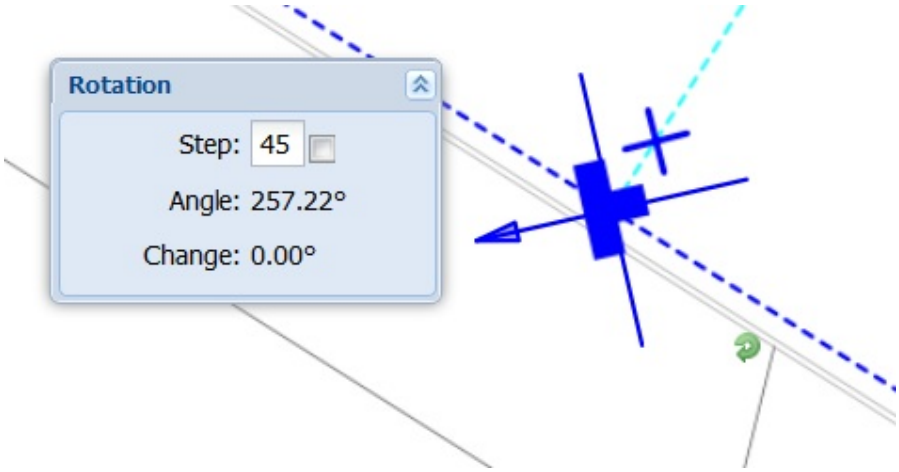
Rotating a point object

To rotate a **point object** on the map, click **Rotate** in the drop-down menu for **Modify** .



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When you click **Rotate**, a **Rotation** form is displayed. You can enter the required angle in the field on this form. You can use the form to define the **steps** as degrees. If Steps is selected, the rotation angle of the selected object changes in steps when you rotate the object. **Angle** displays the rotation angle of the object. You can rotate an object by grabbing the symbol next to the object on the map. Click **Save form** on the form to accept the rotation angle. If you do not want the object to have a rotation angle, cancel it with the right mouse button.

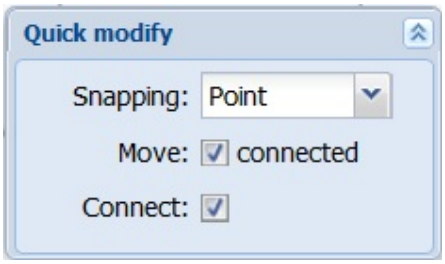


Modifying the geometry of an area

You can modify the geometry of an **Area** by clicking **Modify** on the object form. The points of the area are highlighted, and they can be moved by dragging them with the left mouse button. To create a new point, click the dimmed square in the middle of a straight line and drag it to a new location. Click **Save form** to save the changes.

Quick modify function of an area object

1. Point at the required area object on the map and click the **right mouse button** while holding down the **Control** key. If the map object includes multiple objects, the **Object selection** window will be displayed. Click the required object with the right mouse button and select **Modify** .
2. Select the required options in the displayed **Quick modify** dialogue box.

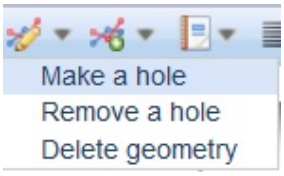


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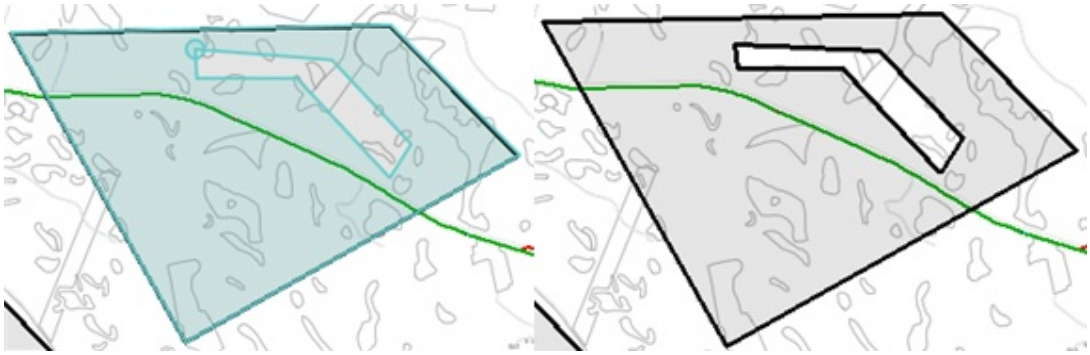
1. **Drag** the points highlighted in red to the required location or **remove** them with the **Delete** key. You can snap to another object by holding down the Shift key while releasing the left mouse button.
2. Click the right mouse button and click **Save** in the **Confirm the move** window to **Save** the changes. Cancel the changes by using the **Pan** function.

Digitizing a hole in an area object

1. On the Area form, in the drop-down menu for **Modify** , select **Make a hole**.



2. Within the highlighted area, draw a hole that has the required shape.



When you stop drawing, the form is saved and the hole has been created.

Removing a hole from an area

1. In the drop-down menu for **Modify** , select **Remove a hole**.
2. Click the hole you want to remove.
3. Confirm the removal.

Deleting the geometry of an object

You can find the **Delete geometry** function in the drop-down menu next to **Modify** . This function deletes the geometry of the selected object making the object disappear from the map. The property data for the object is not changed.

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Creating a new object

Create a new object by defining its location, that is, its geometry. Click **Create** to do this**.** First, select the correct object form. For example, use the **Fireplug** form to create a new fireplug, and the **Water duct** form to create new water ducts. You are usually required to provide at least some **mandatory information** on the form before you can create an object. You can add other object data either before or after creating a new object. Save the object data by clicking **Save form** .

When you click **Create** , a **Drawing options** dialogue box is displayed for the user to define various drawing-related settings for the object. The drawing settings of both **point objects** and **line objects** include **Snapping**, and you can choose whether the object you create snaps to another object's point or the nearest point. The settings for line objects also include **Follow**. You can follow either Completely or Partially. Further information on following and snapping to objects is available in the Snapping and following (settings for drawing and modifying) chapter. The settings for **Drawing** vary, depending on the object that is drawn. In general, line objects have more setting options than point objects.

Creating a new line object

The drawing options for **line objects** include the **Following** function. When you have selected the option **Completely** for **Following**, point at the starting point of the duct to have the line object you create follow, for example, through all the points of the duct and to continue digitization from the end point of the duct. However, if you want to follow the duct only partly, you can select the Following option **Partially**. This lets you follow the duct to the required point, after which you can continue digitizing freely. If you want to follow an object in parallel within a specific distance, define **Distance** in the drawing settings.

Start creating the **geometry of a line object** by clicking the required starting point on the map using the **left mouse button**. Next, digitize the required **points** one by one by clicking the left mouse button at the relevant locations. Finally, end the digitization by **first clicking the left mouse button and then the right mouse button**. The object's location and property values are automatically saved in the database.

Further information on connecting a new duct to a node using the **Snapping** function is provided in the Property attributes and location chapter under Duct tools.

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Creating a new point object

Create a new **point object** by clicking the **left mouse button** at the required location on the map. The program automatically saves the geometry of the object in the database. If saving succeeds, the following text is displayed at the bottom of the object form: **Saved successfully**. The object's location and property values were saved in the database. The **rotation** function for a point object is activated immediately after the object has been created. A blue compass symbol appears over the object, indicating the rotation angle of the object. If you want to modify the object's rotation angle, grab the symbol using the left mouse button and rotate it to the required angle.

An object can also be placed on the map based on coordinates. First, deselect the **Coordinate reading on/off** checkbox in the bottom-right corner of the map view and enter the coordinates for the required location. Then, click the button to create a new object on the map in the desired location. **Save** form.

Creating new objects by using existing objects

You can also create new objects based on existing objects. There are two ways to do this:

1. Retrieve information on an existing object to the form, for example, **by selecting the object on the map.** Click **Create** to create a new object based on the object information retrieved to the form. The program calculates the length of a line object based on the geometry of the new object.

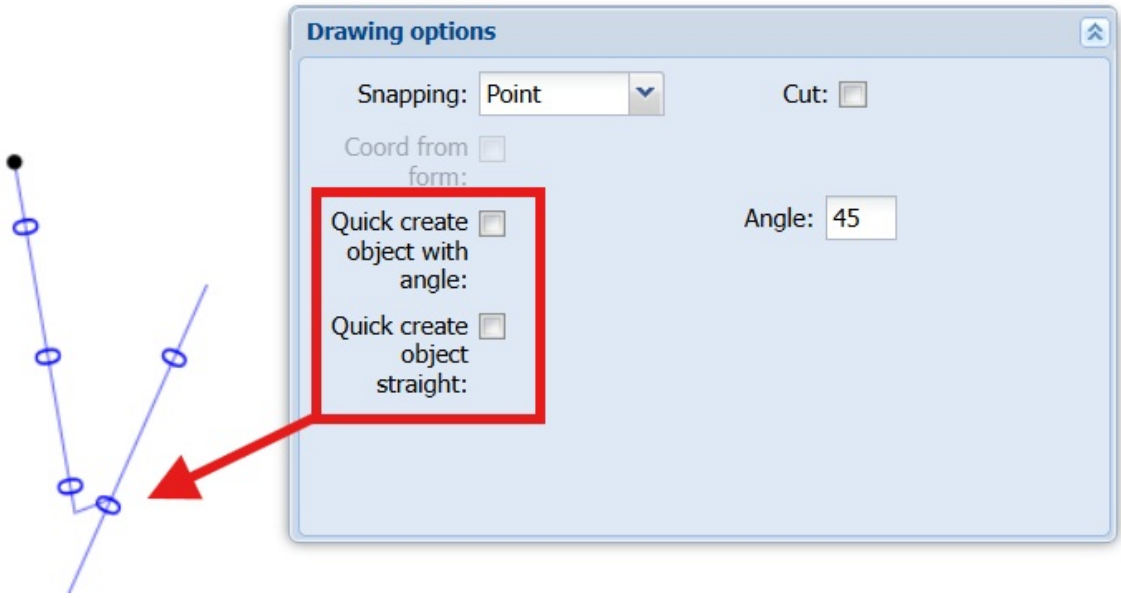
or:

1. In the drop-down menu for **Save form** , click **Save as copy**. A copy of the object on the form will be saved in the same location.

Quick create a water branch based on flow direction

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An additional "Quick create" feature can be used in the **Water** or **Sewer branch** forms when creating a new branch. This feature make it possible to quickly create a water or sewer branch and automatically draw a connecting duct to a new manhole. The angle of this created duct will be towards the flow direction of the duct.

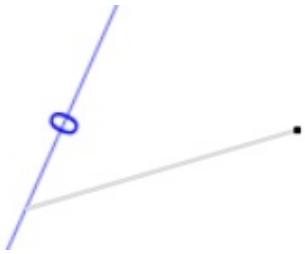


1. Start by clicking **Create** from the **Water/Sewer branch** form's toolbar.
2. From the **Drawing options** select either:
    a. **Quick create object with angle** (The **Angle** field determines the angle for the duct).
    b. **Quick create object straight.**
3. **Left-click** the desired water duct on the map to select it.
4. Choose the splitting point on the duct. This point will determine where the new branch connects:

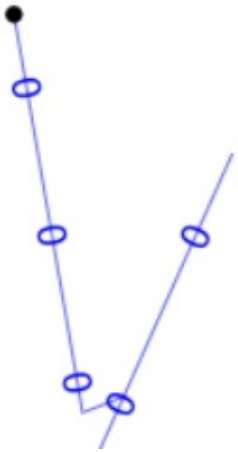


5. Finnish defining the geometry of the new water duct by **left-clicking**. A new manhole will be placed at the end of this duct.

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The result is a new branch connected to the original duct, with a newly drawn duct leading to a newly created manhole. If you chose the **Quick create object with angle** option, the duct will have an angle towards the flow direction of the duct.

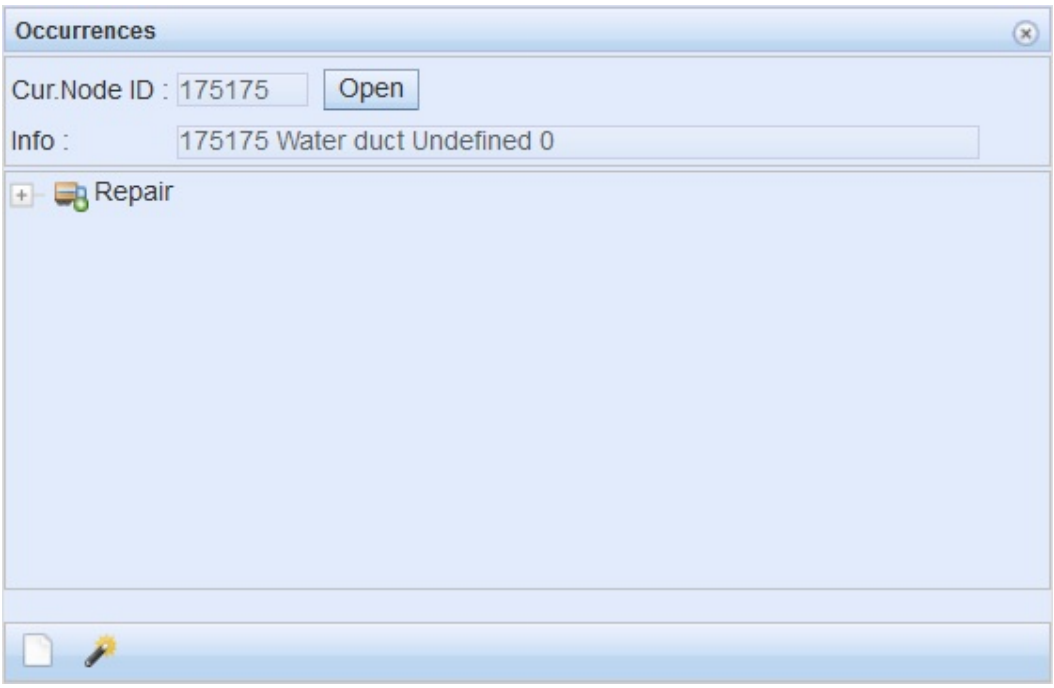


Events

Various **events**, such as **water leak reports**, **state reports**, **quality reclamations**, and **error reports**, or objects can be linked to a work program. To view all events related to the network object in question, go to the object form and click **Events** in the drop-down menu for **Other tools** .

The upper section of the **Events** form provides basic information on the network object in question. For example, the following information is displayed for water ducts: ID, type, material, diameter, and construction year. If there are events related to the object, a list of the events is displayed under the basic information with categorization based on the event type. To view a **list of individual events**, click the icon next to the **event type**.

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Basic information is provided on the events, for example, the recipient and date of a water leak report and the party reporting the leak. To open the **form** in question, click the **right mouse button** on the report line and select **Open**. You can view or update the event information on the form that is displayed.

Adding duct and node information on an event form

Similarly to network objects, location information is added to events. The location of an **event** (state report, quality reclamation, work program) can be the location of an address retrieved for it from the database. Events can also be connected to network objects, in which case the event's location will be the location of the object in question.

The event form is used to connect an event to a node or duct. The name of the field depends on the form, for example, the **Duct** menu on the **Quality reclamation** form includes a **Connect to duct** function for connecting the event to the node/duct. Select the object on the map with the **left mouse button** to connect it. If an address has been assigned to the event, you can go to that address on the map by clicking **Locate** at the bottom of the form. This makes it easier to point at the correct object on the map. **Basic information** on the object, such as ID, type, year of construction, and owner, will be displayed on the form.

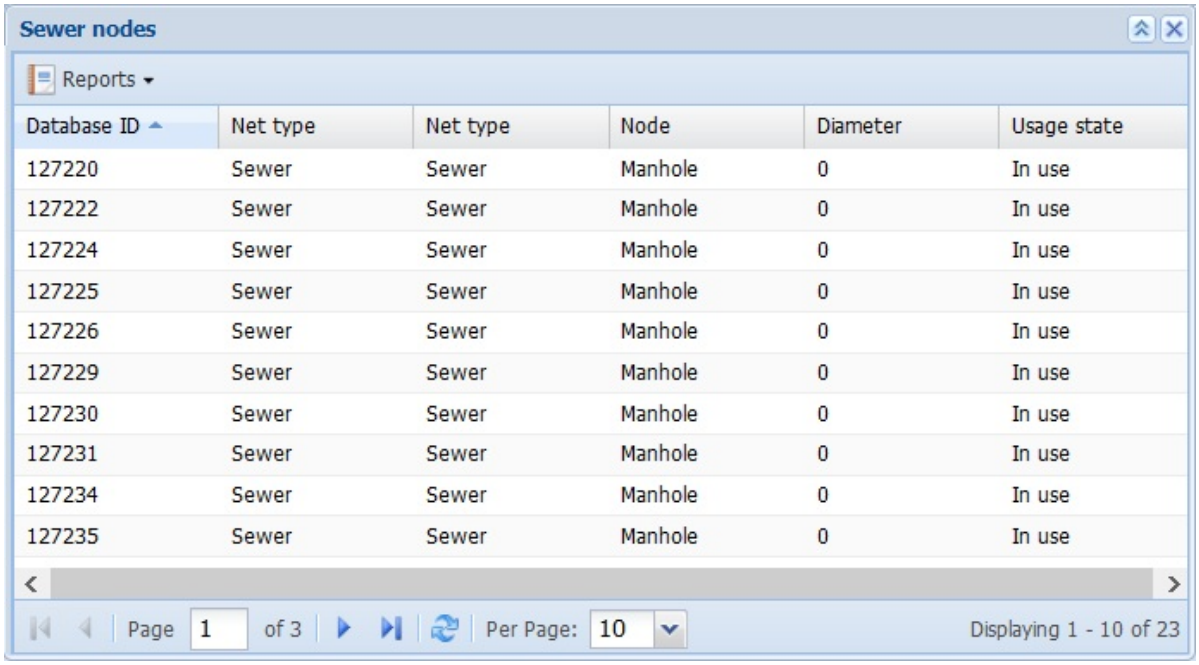


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You can modify a connected node/duct on the object's own form, which you can open by clicking **Edit** in the drop-down menu. You can remove a duct or node that is connected to an event by clicking **Remove** in the drop-down menu.

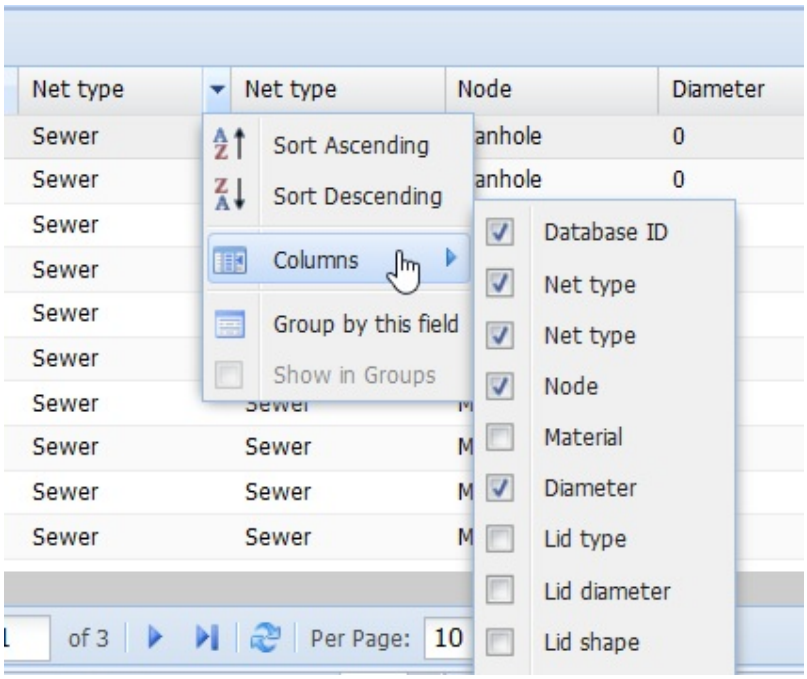
List view

Many object forms include a **List** button. You can use it to view the search result objects in a list view. You can use this function to quickly browse through objects. The number of objects displayed on one page can be modified using the **Per page** selection. Use the arrow buttons to navigate the pages.



To view the tools related to the list, position your mouse pointer over a header field. This displays a drop-down menu for the selected field . In this menu, select the columns you want to include in the list view.

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The menu includes an option for sorting the list based on the selected field, either in ascending or descending order. The **Columns** function lets you select the columns that are displayed in the list view. The lists include the typical information for the object type as default data. The **Group by this field** function groups the list contents based on the selected field. The grouping can be cancelled by deselecting the **Show in groups** checkbox in the drop-down menu.

You can open a listed object displayed on the form by clicking the object with the right mouse button and selecting **Edit selected**.

You can use the **Reports** function to create an Excel report on the listed objects. The **list report** includes the same information as the list form.



Show in group display

In the drop-down menu for **List** ≣ , select **Show in group display** to move the current search results from the form to a group display. Group displays are discussed in more detail in the chapter Group display.

User filters

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The **User filters** feature allows you to display only selected KeyAqua objects on the map, based on criteria defined in the object forms. The feature is available on all duct and node forms.

Setting up the user filter

1. Open an object form via the **Duct tools, Sewer node tools or Water node tools** from the main toolbar.
2. Use the **Search** or the **Pick** features to search existing network objects in the system, for more details, see Retrieving information to a form or **alternatively** on an empty form, begin by entering the required information and creating a new object. For more details, see Creating a new object.
3. Once you've chosen an object or defined an object group, click **Add to user filter** on the form's toolbar to set them up part of the filter.

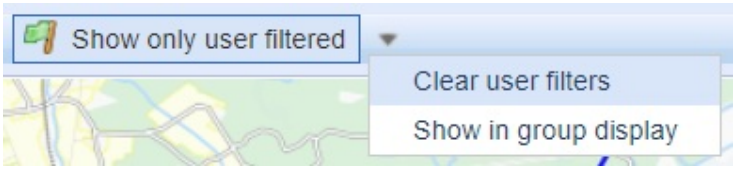


4. To activate the filter, click **Show only user filtered** on the KeyAqua's main toolbar. The icon will change from blue to green when active.



5. Only objects that are part of the user filters will appear on the when the filter is active.
6. You can add more objects to your **User filters** at any time by opening their form and repeating the process.

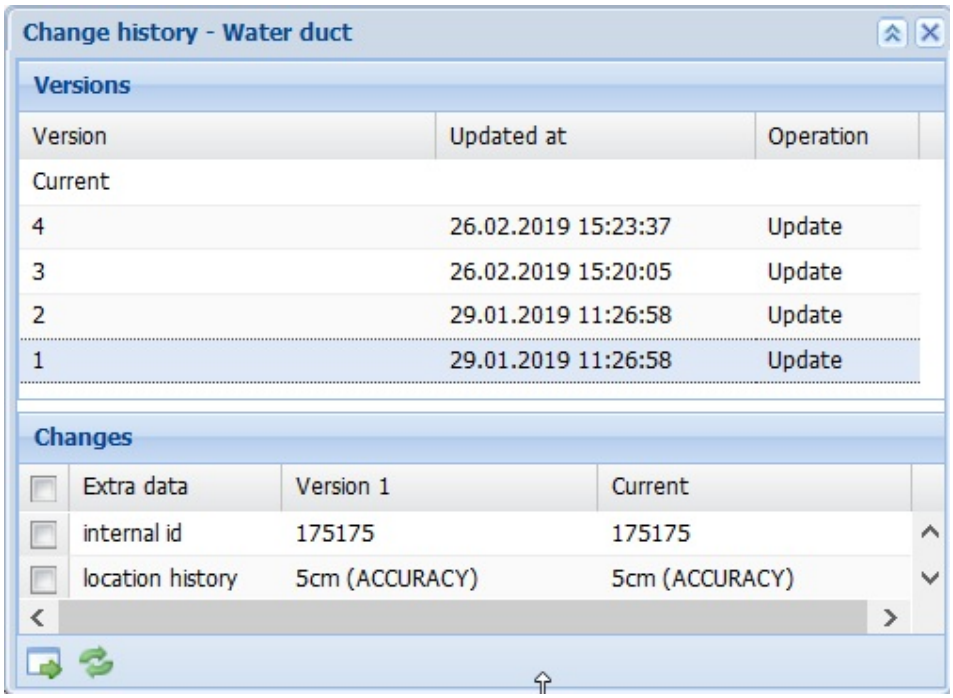
To manage your filters, click Show in group display from the drop-down menu. To remove all filters, click **Clear user filters**.



Change history

To view the change history of the object on the form, click **Change history** in the drop-down menu for **Other tools** . The top section of the displayed form lists the various object **versions**, while the bottom section displays the **changes** made to the selected version.

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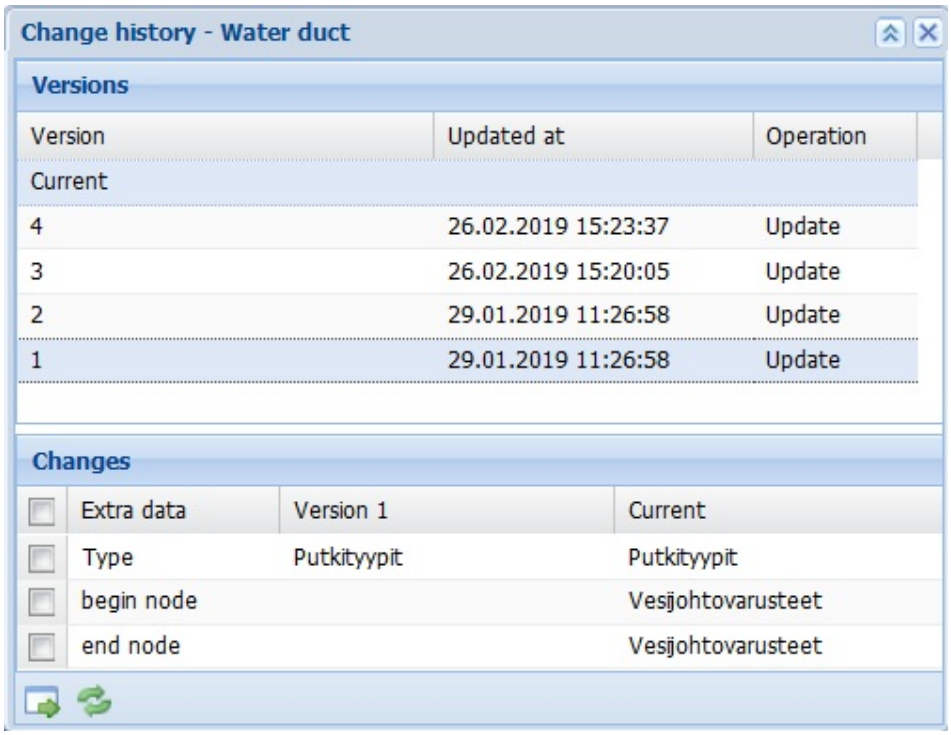
Restoring the values of an object

1. In the **Versions** section, select the row that you want to restore.
2. In the **Changes** section, select the checkboxes for the rows that you want to restore.
3. Click **Restore** to update the selected information on the object form.
4. Click **Save form** on the object form to confirm the changes.

Comparing object versions

In the **Versions** list, select the rows for comparison to see, in the **Changes** list, the current version in addition to the selected versions.

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Reports

Reports can be created from forms, lists, and the main toolbar. Creating a report on objects that are included in a list of search results is discussed in the chapter List view. Click **Export** to open the **Reports** menu for an object form.

You can create various types of reports in the system. Each form has its own reports. For example, you can create a **Bill of Material** for an object group by clicking the **Info** button. The information on the search results displayed on the form is used to create a report. It is possible to export reports in either PDF or Excel format, depending on the type of report.



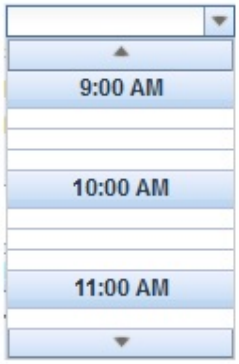
Entering a date and time

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Date information is a property attribute used on several forms. On reporting forms, a date is required, for example, to determine when a leak happened, while on node forms, it is used to determine the survey date. Adding a date has been standardised using a calendar, so that the same format is always used when dates are entered in the database. This makes it possible to search the database with the date as a search criterion, as search results are then not incomplete due to dates being entered in various formats.

Position the mouse cursor over the **Date** field and click the left mouse button to open the calendar window. The current date is selected as default. You can browse through months using the arrow buttons at the top of the calendar window. To browse through years, click the year on the right or left, depending on whether you want to go back or forward. To select a date, click the correct day using the **left mouse button**. The calendar window is closed, and the selected date is displayed in the **Date** field.



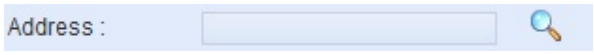


Some forms also include a field for **time**. For example, the start and end times of a leak are added in reporting forms. You can select the time by clicking the **Time** field to the right of the Date field. The list for selection is then displayed. You can define the time based on 15-minute intervals. Scroll the list using the mouse wheel or position the mouse pointer over the arrow buttons above or below the list. This scrolls the list automatically in the direction of the arrow. Use the **left mouse button** to select the time. If necessary, specify a more detailed time by entering it directly in the **Time** field.

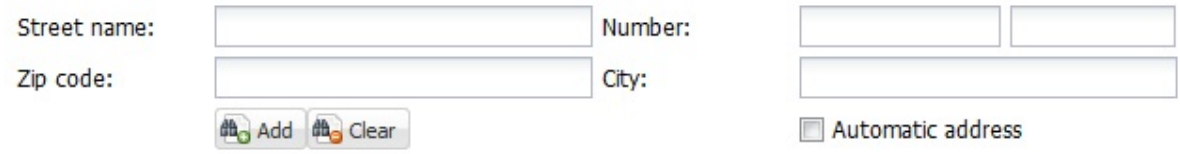
Managing address and apartment information on object forms

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For some forms, address information is added **from a database** by clicking **Pick address** . Examples of such forms include reporting forms. When addresses are retrieved from a database, addresses contain no spelling errors and they can be used as one search criterion. For example, if map location information is not added to an event report, it will be determined based on the address.



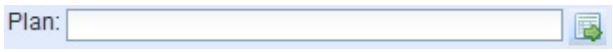
The **Address** form opens when you click the **Pick address** button. If an address has already been added for an object, an **Address** form including that address will be opened, with the other fields of the form being empty. Retrieving addresses to forms is discussed further in the Address search in the database chapter. If the specified address is active on the **Address** form, you can transfer it to an object form by clicking **Update to form** .



To enable automatic adding of an address, select the **Automatic address** dialogue box and click **Save form**. The nearest address is used and the distance to the nearest address is displayed at the bottom of the display.

Using the predictive search field

Some forms have a predictive search field that is used for connecting the object to another object, such as a **Plan**.



1. In the predictive search field, enter at least the first three characters of a name/identifier.
2. From the displayed search results, select an object or continue typing to limit the number of options.

If you do not know the name/identifier:

1. Click **Open form** to open the object form.
2. Retrieve the correct object to the form by clicking **Search** or **Pick** .
3. When the correct object is displayed on the form, click **Update to form** .

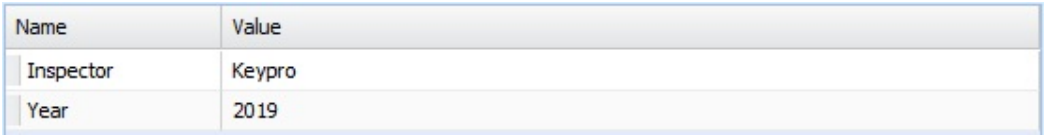
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Free-form property attributes

The following forms allow so-called free-form property attributes to be added to objects:

- Duct forms
- Node forms
- Customer/Consumer Point form
- Error report form
- Repair and Maintenance forms

If some free-form property attributes have been added to an object form, the form includes an **Extra data** tab where such information can be viewed.



Name	Value
Inspector	Keypro
Year	2019

You can use the free-form property attributes when searching for objects, and they can be included in the **List** function and the related report. The **admin** user of the system can freely define the free-form property attributes, name them, and select the data type to be applied.

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DUCT TOOLS



Ducts are line objects. The two object forms for ducts can be found in the drop-down menu for **Duct tools** . Click **Sewer duct** to open a form that is used for sewer, rainwater and mixed water ducts in sewer and pressure sewer networks. Click **Water duct** to open a form for ducts belonging to water networks. The use of buttons common to both forms is discussed in the chapter GENERAL FUNCTIONS OF THE OBJECT FORMS.

Property and location information

To start creating a new duct, complete the form. Mandatory fields are marked with an asterisk (*) on the form. After filling in the data, click **Create** to create an object on the map. The length (**2D length** and **3D length**) of the object you created will then be displayed on the form, and the location and property information will be stored in a database. When you click the **Create** button, the **Drawing options** dialogue box is displayed. The related functions are described in the chapter Snapping and following (settings for drawing and modifying).

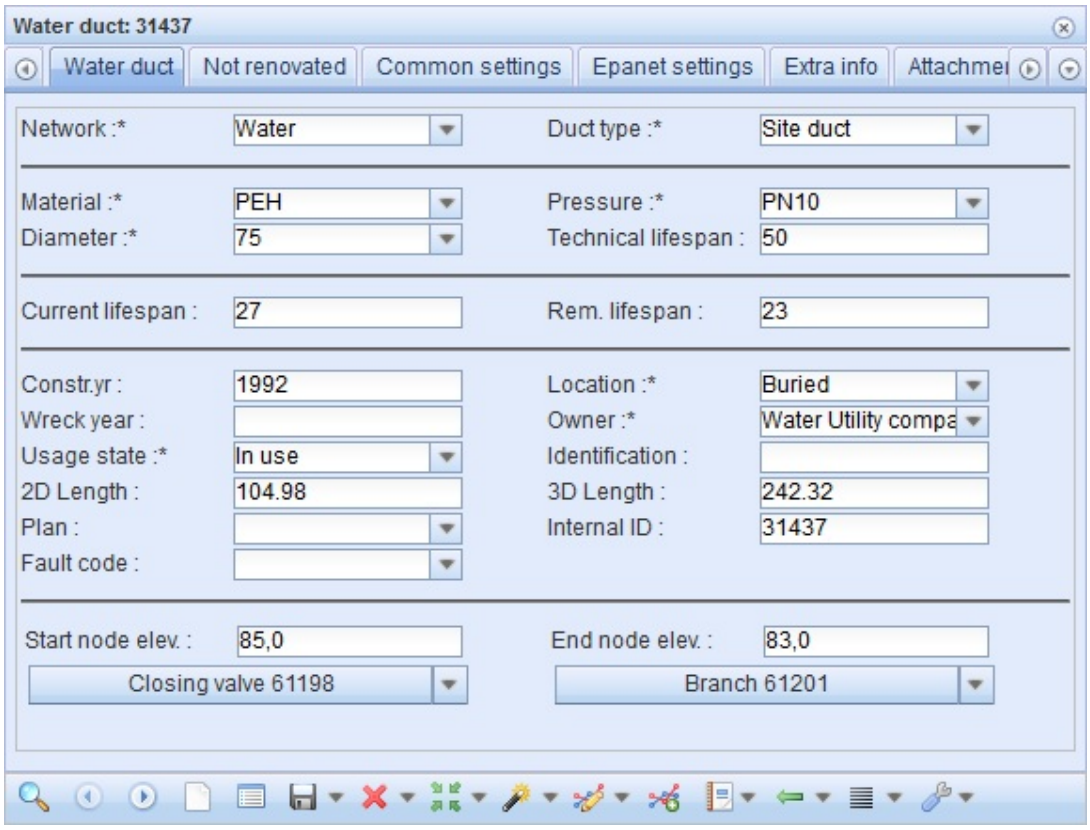
A new duct can be **connected to a node** as soon as it is created. When digitizing a duct, use the **Snapping** function: **hold down the Shift key** while clicking the left mouse button **over the node**. The duct will then be connected to the node and the following text is displayed at the bottom of the screen: **Snapping completed. Snapped to object X.** If the text **Snapping failed** is displayed at the bottom of the screen, you have tried to connect the duct to an object that it cannot be connected to. When the Snapping function is active, the mouse pointer on the map changes to a light-blue circle. Finally, end the digitization by **first clicking the left mouse button** at the end point of the duct and then the **right mouse button**. Click **Save**. The elevation values for the nodes will be displayed on the form in the start and end node fields, and the location and property information will be stored in a database. The elevation used for the connection is discussed in more detail in the chapter Drawing options and duct elevation.

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In the example figure below, a new duct can be created between two nodes by snapping to the nodes, that is, by connecting the duct to them.



Similar property information is entered on the Sewer duct and Water duct forms, but the Sewer duct form is used for sewer ducts and rainwater and mixed water ducts. The Water duct form is used only for water network ducts. For example, water ducts are displayed on the map in blue, sewer ducts in brown, and rainwater ducts in green. Before or after creating a geometry, enter the other property information on the form.

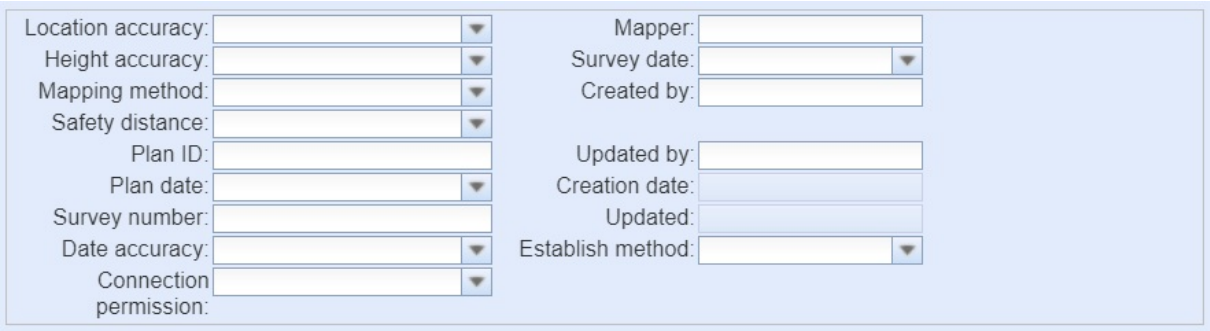


Information on the technical lifespan can be stored in the system for each duct type (Material/Diameter). The software will automatically calculate the current and remaining lifespans for the duct based on the technical lifespan and installation year. Users cannot themselves enter the values in these fields, but the values can be used, for example, in various searches.

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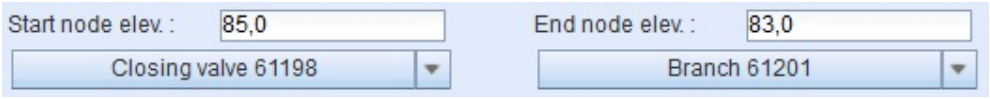
Other property information is selected from the menus or entered into fields. Click **Save form** to save the information. The program will automatically calculate the object's length on the form on the basis of the object's location information. You cannot change the values in the Length field manually.

The **Common settings** tab is used for entering information on location and height accuracy, mapping, planning, and the saving of data. The **Common settings** tab is similar for both duct and node forms. On the **Extra info** tab, you can save free-form text.



Start and end node information

Information on the start and end nodes and their elevation and tools for disconnecting and connecting nodes can be found at the bottom of duct forms. If a node is disconnected, the same button can be used to connect a new node to the duct. With the **Snapping** function, ducts can be connected to nodes already when the ducts are being digitized, or this information can be updated later. The ID for start and end nodes is the ID of the node at which the heads of the duct end. To view the details of the node, open the drop-down menu of the node and click **Edit node** to open the node's form.



The node's elevation is displayed in the **Start node/elev.** and **End node/elev.** fields. You can highlight the start node on the map by clicking the start node's ID button. Similarly, you can highlight the end node on the map by clicking the ID button of the end node. The nodes are highlighted as red squares on the map.

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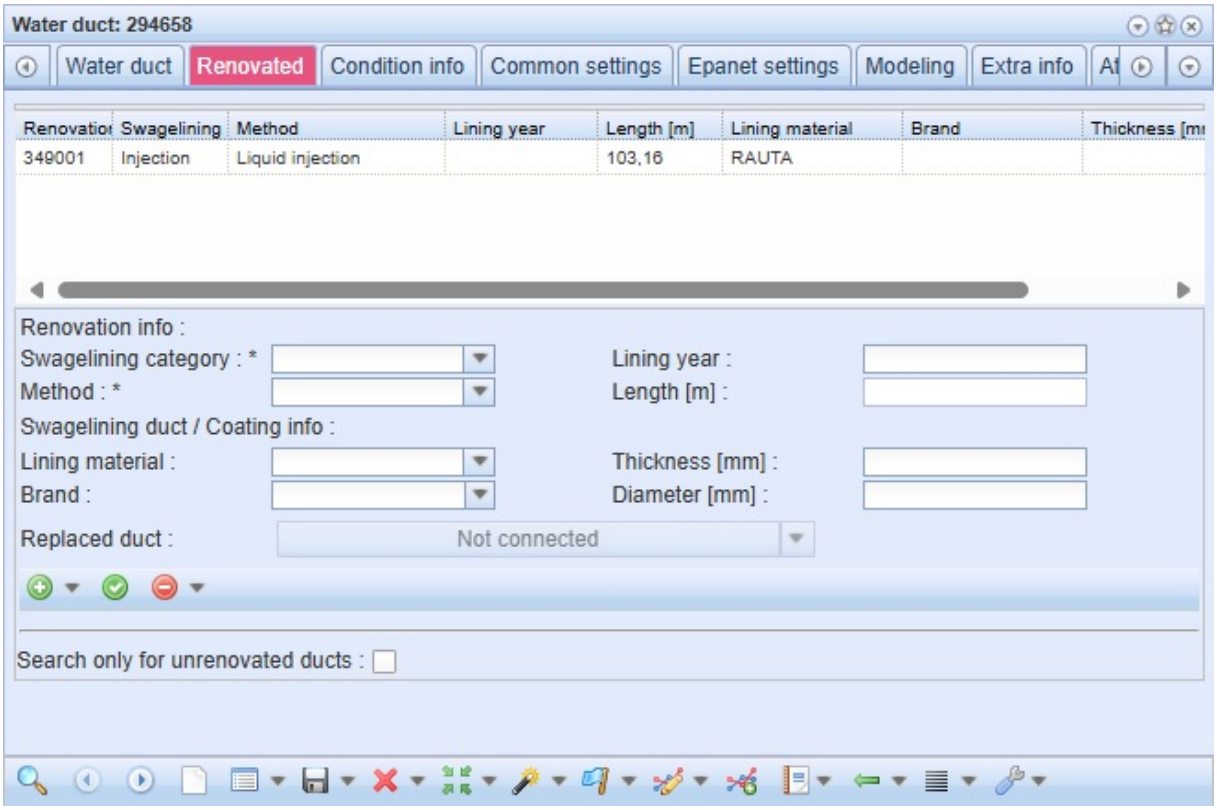
To disconnect a node from a duct, open the node's menu and select **Disconnect**. To **connect a duct to a node**, go to the drop-down menu, select **Connect**, and hold down the left mouse button to **define** on the map the node that you want to connect to the duct. If the node in the defined area is too far away, a notification saying that the connection failed will be displayed.

If you pick **more than one node** on the map, an object selection list with all the nodes in the defined area will be displayed. To select the correct node from the list, double-click it or click the right mouse button over the correct node and click **Select target**.

Duct renovation

The renovation information on a duct is saved on the **Renovated/Not renovated** tab. If the duct has been renovated, the tab's name is **Renovated**. Similarly, if the duct has not been renovated, the tab's name is **Not renovated**. Renovation can take place either for the entire duct between two nodes, for a defined length, or for some other section of the duct. If renovations have been saved for the duct, they are listed on the tab.

The renovation information includes the mandatory fields **Swage lining category** and **Method**, and the non-mandatory fields **Lining part, Lining year, Length, Material, Brand, Thickness,** and **Diameter.**



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To store renovations in the selected duct, click **Add new renovation** . To apply the same renovation to all ducts in the search group, select **Add to all ducts** from the drop-down menu. A unique **ID** is automatically saved for a renovation. Scroll the bar to the right to view all information. The geometry of the lining will be automatically saved in the system.

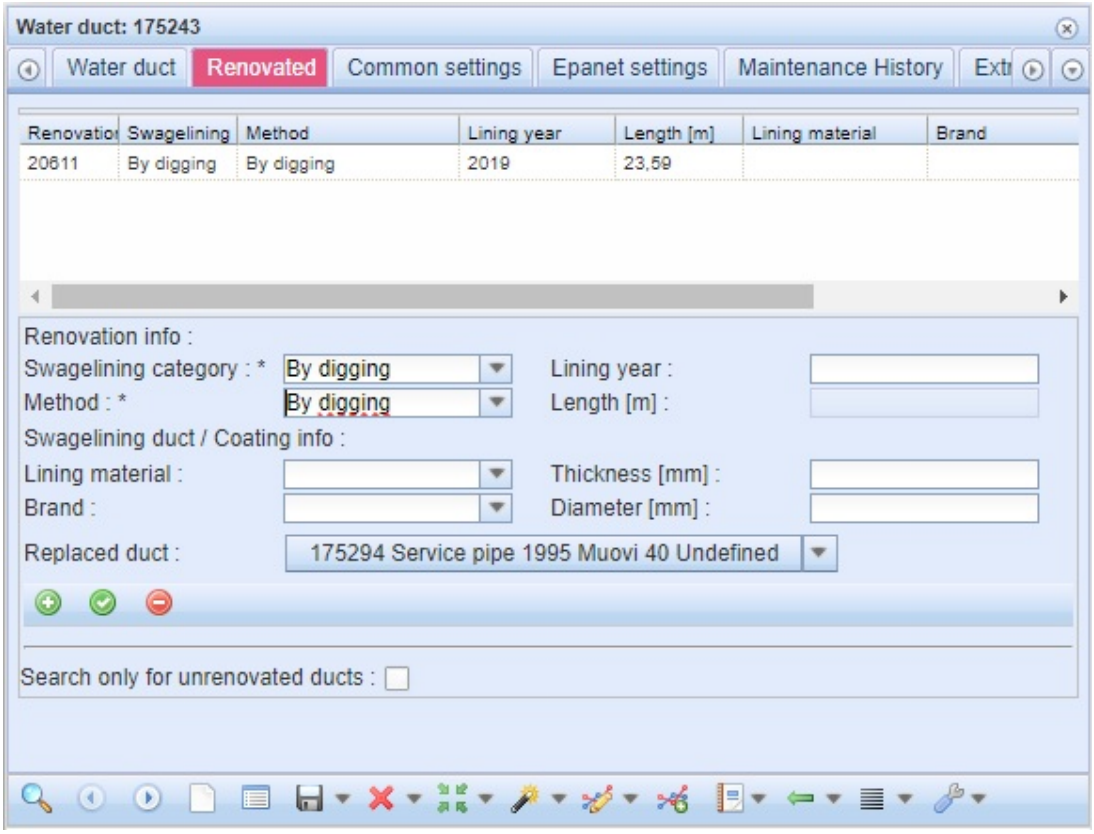
A renovation can be modified by activating its details. On the list, click the renovation line in question with the left mouse button. Click **Apply changes** to update the information.

Renovations can be removed by clicking **Delete renovation** when the renovation line is active. This will prompt you for a confirmation: **Are you sure you want to delete duct renovation?** Select **Yes** to delete the renovation or **No** to cancel the deletion. The text **Deleted successfully** will be displayed at the bottom of the form and the renovation will no longer be listed. To remove the same renovation from all ducts in the search group, select **Clean all renovations from the current search group** from the drop-down menu.

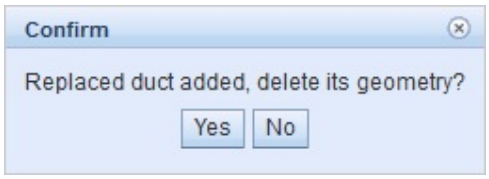
Duct renovation by digging

If the renovated duct is no longer used and has been replaced with a new duct, information on the replaced duct can be added to the new duct on the **Renovated** tab. In this case, a new renovation with the following **Swage lining category** and **Method** will be added to the duct: **By digging**.

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Once the renovation has been saved, go to the drop-down menu for **Replaced duct** to select the duct that the new duct replaces. To define the duct on the map, hold down the left mouse button and draw a rectangle that includes the required duct. When a duct has been selected, you will be asked whether the geometry of the replaced duct should be deleted.

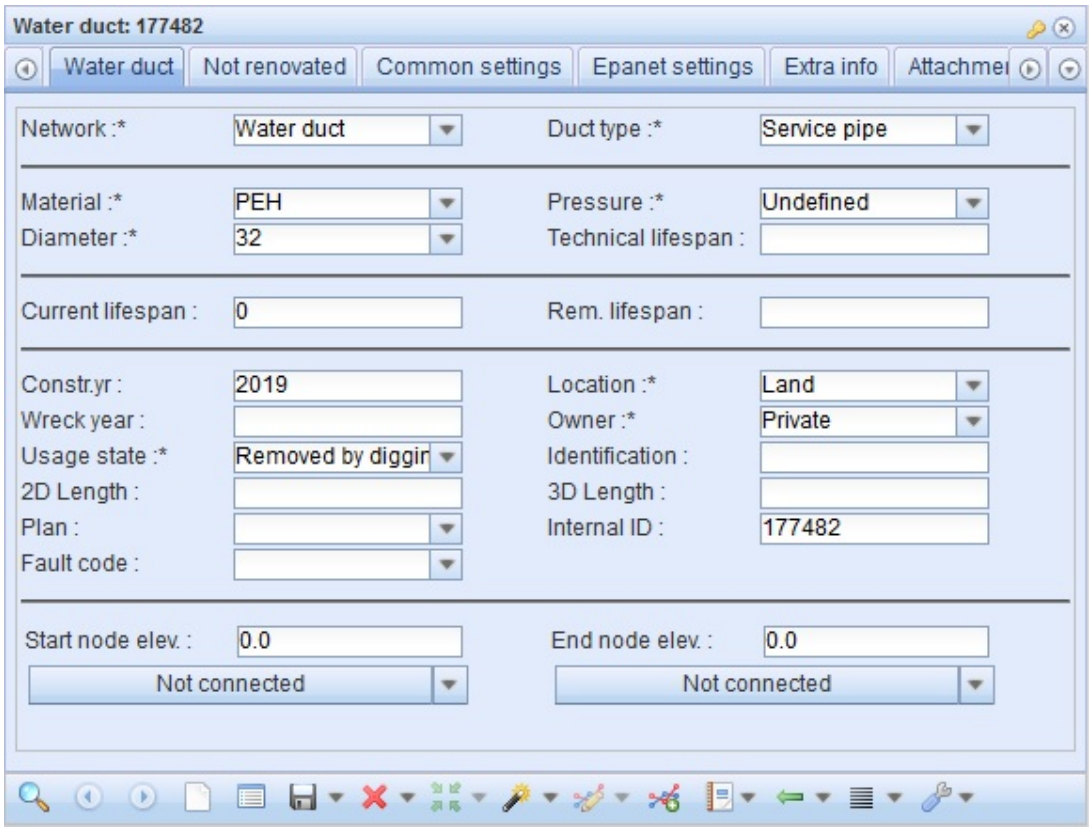


Click **Yes** to delete the geometry of the replaced duct. The geometry of the replaced duct has been now deleted and the **Locate** and **Modify** tools are not available but its information is retained in the system, for example, for reporting purposes. The connections to the existing network have been deleted separately. Click **No** to maintain the duct geometry.

Note! Remove the connections between the deleted duct and the existing network.

To access the form of the replaced duct, select **Edit** in the drop-down menu for **Replaced duct**. The **usage state** of the replaced duct has been changed to **Removed by digging**.

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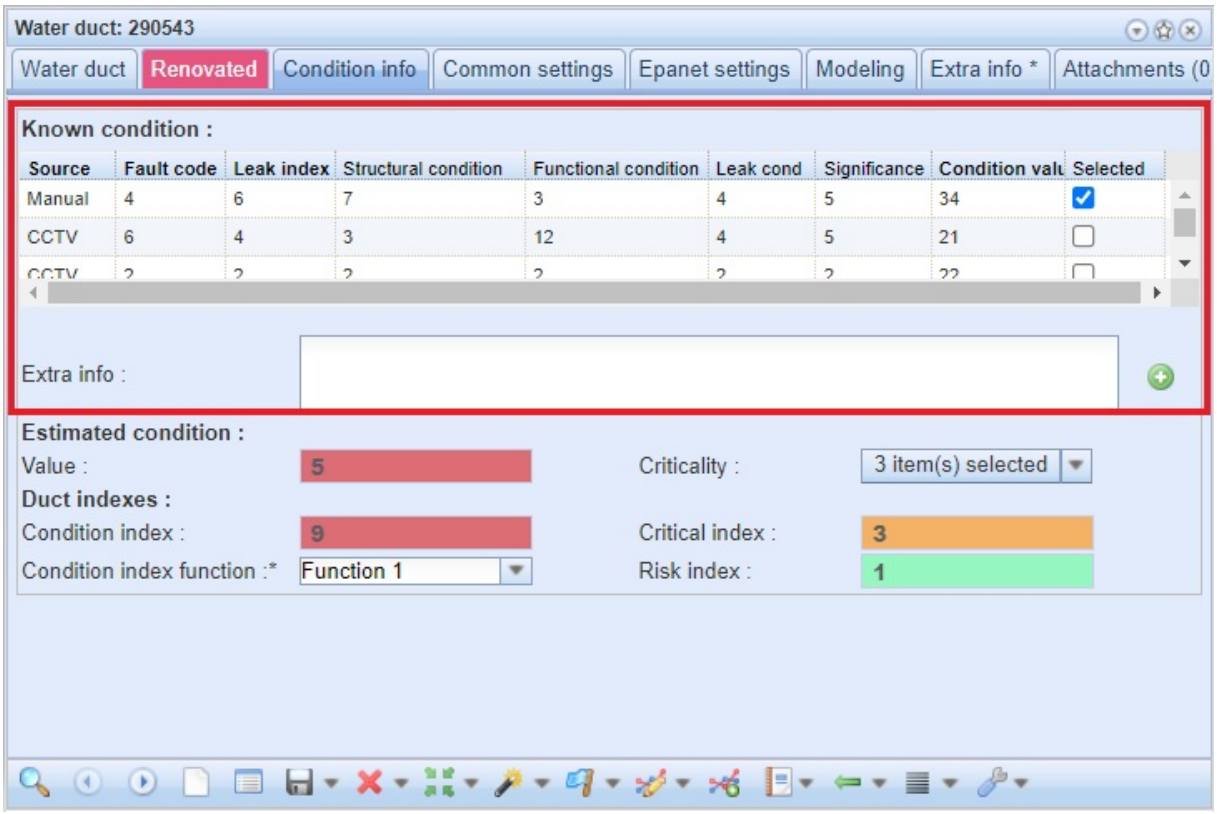
Duct condition classification

Condition info tab on KeyAqua **Water duct** and **Sewer duct** forms show the various **known condition** information (structural condition, functional condition, leaks etc.) for the active duct on the form. It also shows the duct's **estimated condition** information, which includes the criticality value and estimated condition based on the build year and material. By using the **known condition** values with the **estimated condition** values certain condition indexes are calculated as the result.

Known condition of the duct

The known condition information is gathered from different sources, for example, REST API and CCTV-imaging. The information is shown in the grid at the upper part of the form.

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The meaning of the fields:

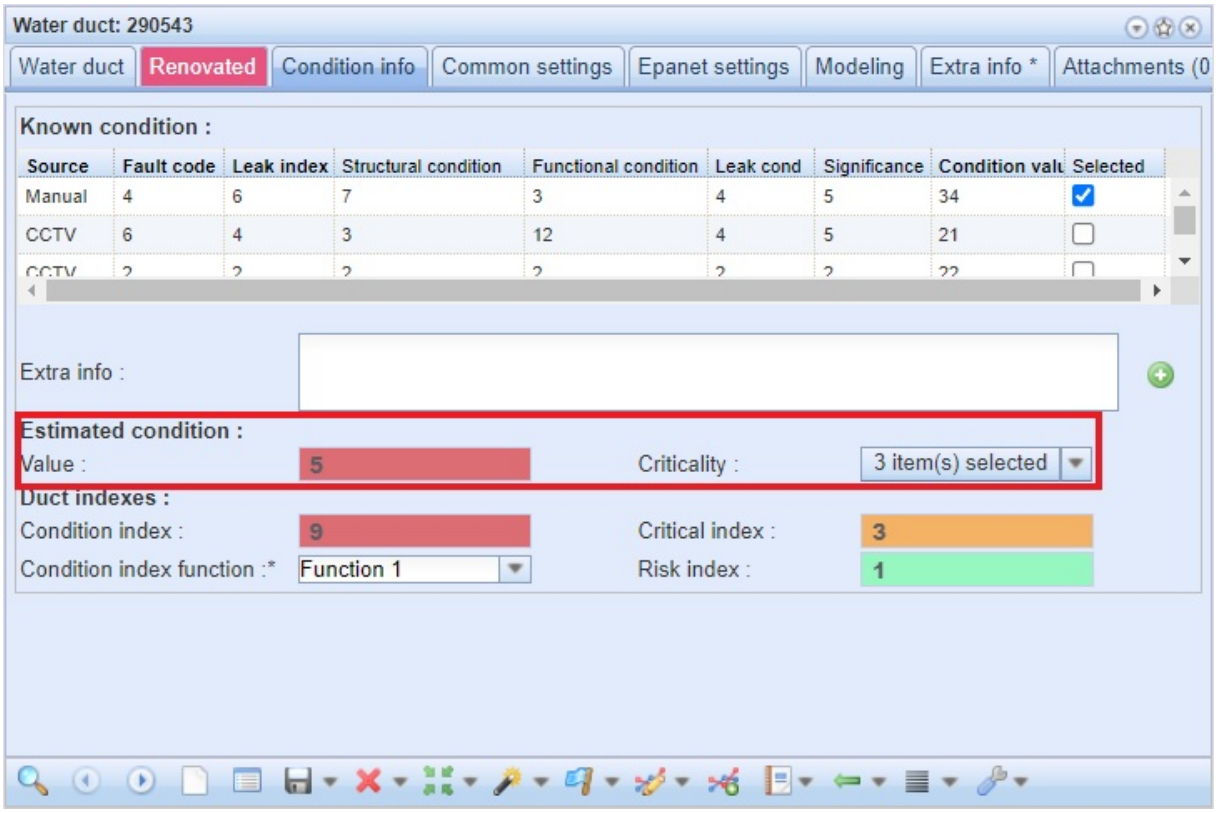
- **Source**: Tells where the information came from. For example, from CCTV.
- **Fault code**: A condition factor from a 3rd party.
- **Leak index**: A condition factor from a 3rd party.
- **Structural condition**: The value that is given for the physical condition of the duct.
- **Functional condition**: The value that is given for the functional condition of the duct.
- **Leak condition**: The value given for the condition based on leaks in the duct.
- **Significance**: The value given for the significance of the leakage.
- **Condition value**: In CCTV, this is the value calculated based on the structural, functional and leak condition values.
- **Selected**: In case of a duct having many rows of information, the selected one is used in the index calculation.

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The fields with **bolded headers** are the ones that are used in the **Condition index** calculation. These fields are **Source**, **Fault code**, **Leak index** and **Condition value**. There is also an **Extra info** field below the grid for adding free-form text about the condition of the duct. To add a new field for the **Known condition** grid, click the **Add new detail row** button.

Estimated condition of the duct

Estimated condition section can be found below the **Known condition** section. It consists of two fields: **Value** and **Criticality**. The **Value** is fetched from API provided by duct condition service. Read more in Duct condition information. It uses the build year and the material as parameters and returns an integer value.



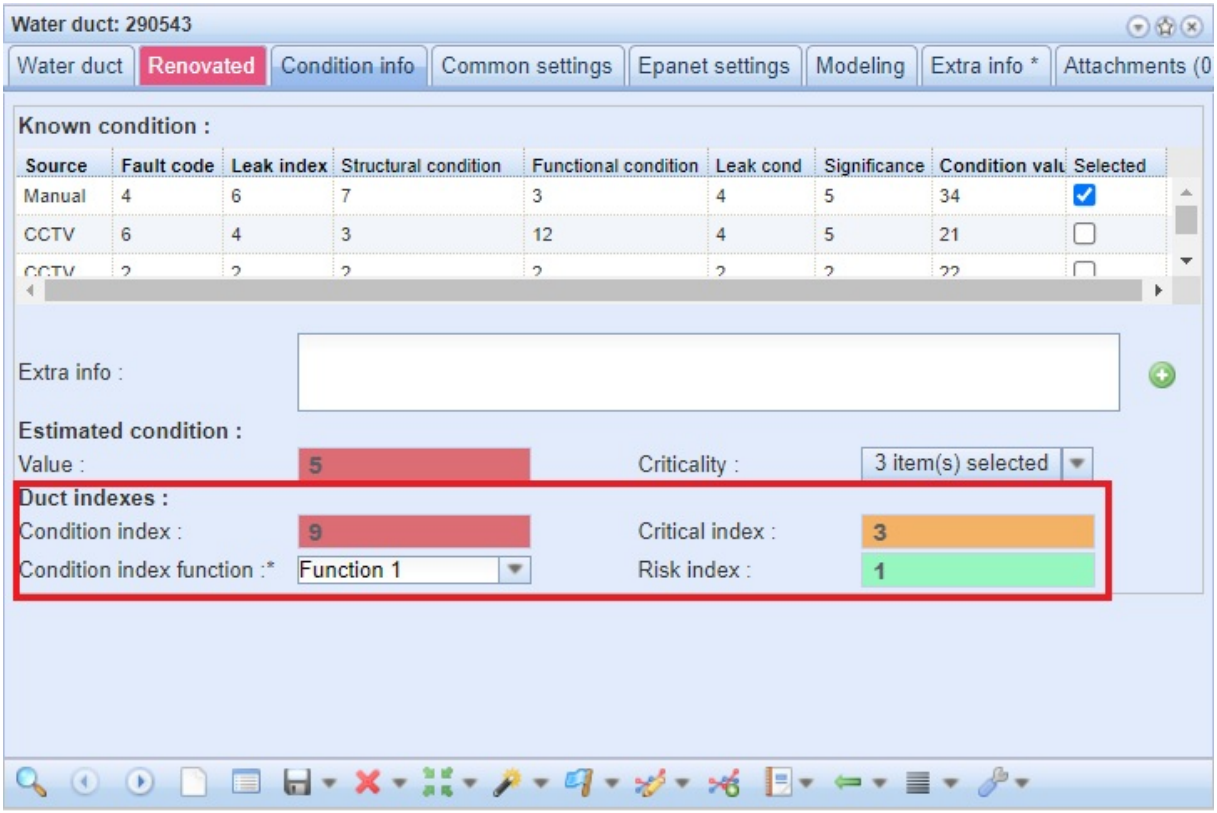
There are four different types of criticalities. Multiple choices can be selected. **Criticality** tells whom the condition of the duct is critical to:

- Critical for customer
- Critical for network
- Critical (ground water area)
- Other

Duct indexes

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Below the **Estimated condition** section are the **Duct indexes** which represent the actual condition of the duct. In section there are three index fields and the dropdown **Condition index** function.



Duct indexes:

- **Condition index function**: Used in calculating the **Condition index**.
- **Condition index**: The value calculated using the condition index function and known condition values.
- **Critical index**: The number of selections in the **Criticality** field
- **Risk index**: For the **Risk index** there is a text constants group. The value is fetched from the **Additional data** field which includes a matrix table. This table calculates the data based on **Condition index** and **Criticality index** fields. If the **Risk index** value cannot be found it will be set to 1.

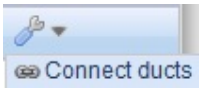
Splitting a duct

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You can split water and sewer ducts with the **Split** tool in the drop-down menu for **Modify** on the forms in question. Alternatively, you can do that when you add a node, in which case a node will be added to the splitting point and the head of the split duct will be connected to the node. The **Split** function is described in more detail in the chapter Splitting a line object.

Connecting ducts

Two or more ducts can be combined into a single duct using the duct connection function. In the drop-down menu for **Other tools** , select **Connect ducts**. Select the ducts in the order in which you want to connect them.



The following properties of the connected ducts must be the same:

- Duct type
- Material
- Diameter
- Constr. yr
- Mapper
- Survey date
- Mapping method

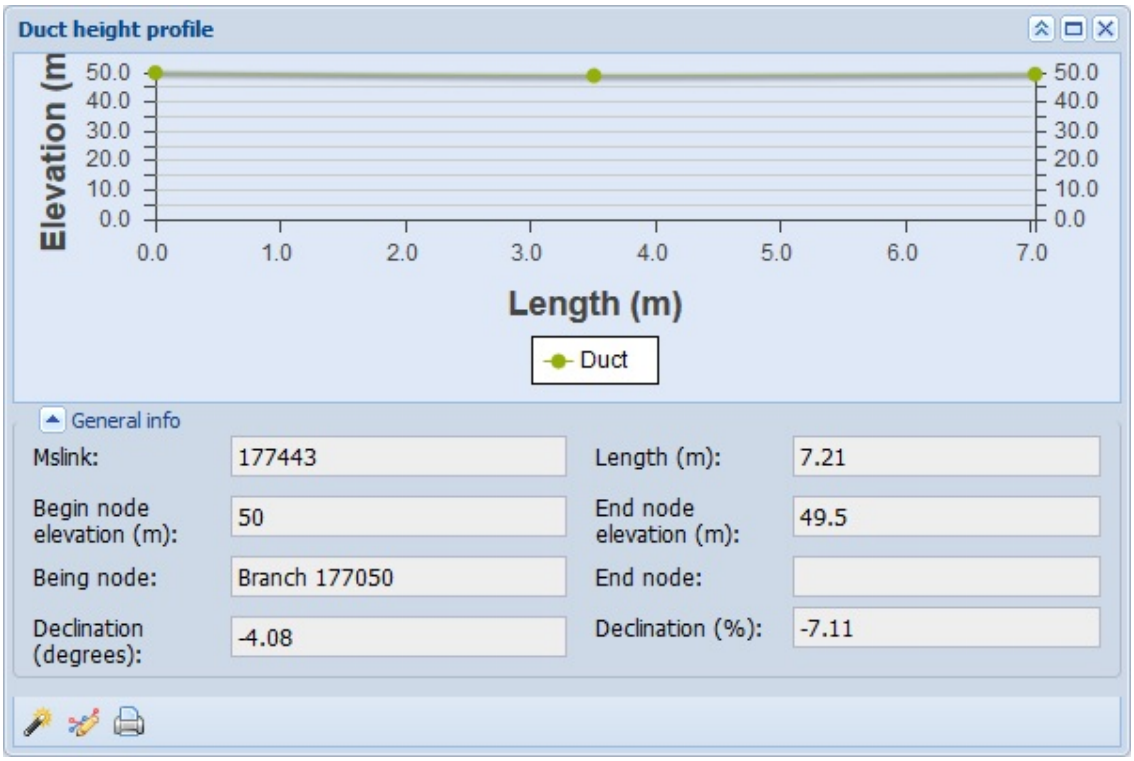
Other property information will be copied from the first duct. **You cannot connect ducts with different network types.**

Duct height profile

The duct height profile for ducts provides lateral information on the duct's elevation relative to the ground. You can activate this tool either on the **Duct** form in the drop-down menu for **Other tools or** by clicking **Height profile** in the **Common** tools.



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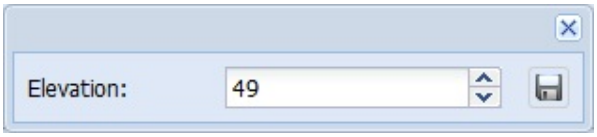


Note! Terrain contour lines can also be added to your KeyAqua. This function is subject to a separate order.

You can use the **Pick** tool to select a duct directly from the map. The selected duct will then be displayed in the form.

In addition, the **Duct height profile** tool can be used to modify the elevation of the points of the duct. To do this, click the point of the duct on the curve and enter the new elevation value in the dialogue box that is displayed.

You cannot use the **Duct height profile** tool to change the elevation of the duct's start and end nodes, but you must make these changes on the **Duct form** (Open **Duct** form) or with the **Node ducts and elevations** tool. Duct curves can be hidden by clicking the Duct text.



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NODES

Types of sewer and water duct nodes

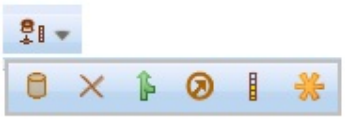
The nodes for sewer and water duct networks are **point objects**. The related forms are divided into two menus: **Sewer node tools** and **Water node tools** . The menus can be found in the KeyAqua toolbar. The forms are similar in function and information content, so the node tools are used in a similar manner on all node tool forms. The buttons for the general use of nodes are discussed in the chapter GENERAL FUNCTIONS OF THE OBJECT FORMS.

Water nodes:



- **Water Manholes**
- **Water Valves**
- **Water Branch**
- **Water pumping stations**
- **Water measuring point**
- **Water other nodes**
- **Fireplugs**
- **Fire water stations**
- **Hydrants**
- **Water tank**

Sewer nodes:



- **Sewer manholes**
- **Sewer valves**
- **Sewer branch**
- **Sewer pumping stations**
- **Sewer measuring point**
- **Sewer other nodes**

Property and location information

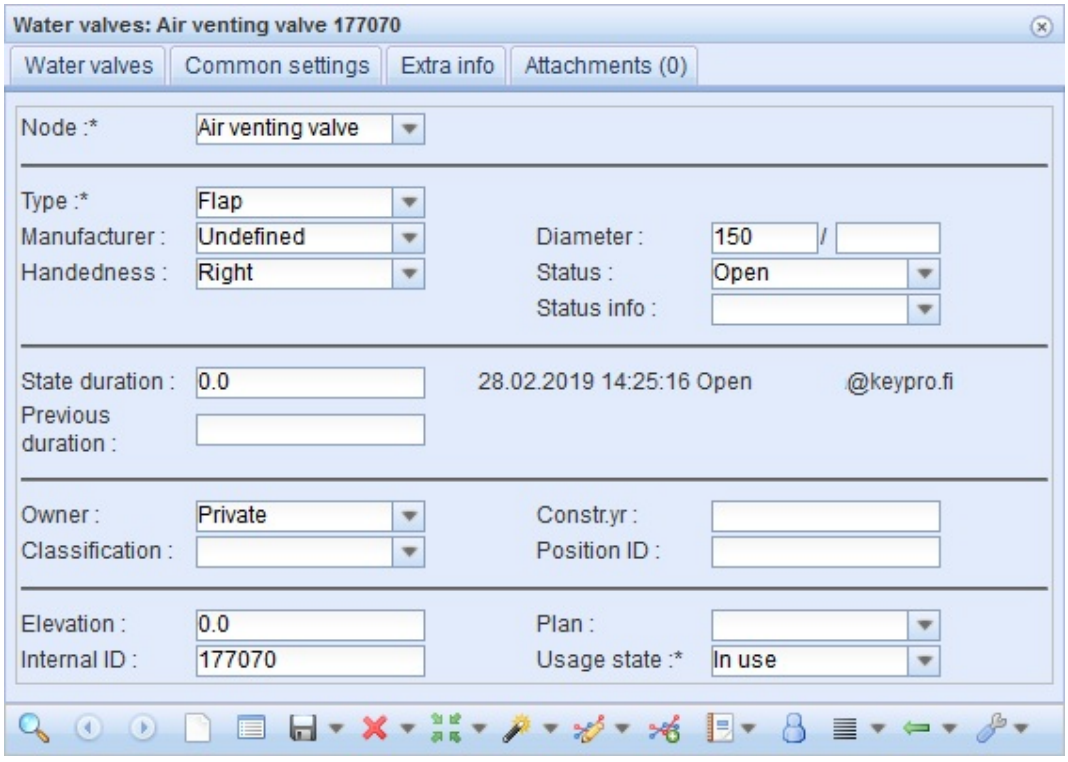
To work with a specific node, open the form. Regardless of the applicable type and object form, nodes have **similar property attributes**. When you want to **Create** a new node for a **sewer network, network** and **node** are mandatory fields. Forms may also include other mandatory fields. Due to the type of network, there can be one or two menus, depending on the form, and they must be completed. In the case of **water network nodes**, **node** is always a mandatory field. **The mandatory fields are marked on the forms with an asterisk *.**

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After entering the data, click **Create new** to create an object on the map. When the object is created successfully, the following text is displayed at the bottom of the form: **Saved successfully**. You can also rotate an object using the **Rotate** window and the symbol. Rotating an object is discussed in further detail in the chapter Rotating a point object. You can then enter other property values for the object and save them in the system by clicking **Save form** .

You can provide detailed information about the object and its type on all forms. For example, the Class of a fire plug class can be Ground fire plug, Wall fire plug or Undefined.

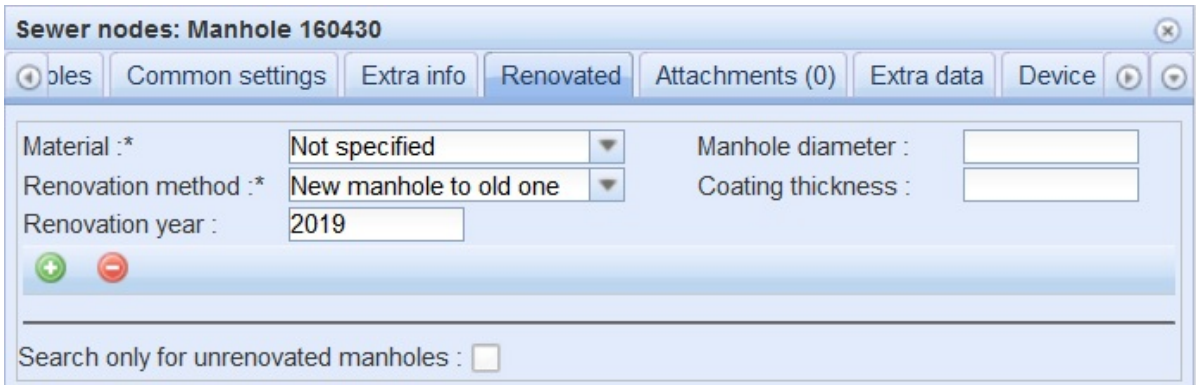
The property values added to a node depend on the node in question. For example, you can enter information on the type, manufacturer, and handedness of a **water valve**. Information on the owner, construction year, classification, position ID, and the node tool's elevation can be completed for all nodes. The node tool's elevation is entered in metres, with a full stop used as the decimal separator. The **Common settings** tab is the same for all node tools and ducts. Use this tab to enter information on location and altitude accuracy, mapping method, plan, survey, and the storing of the data in the system. On the **Extra info** tab, you can save content in free form.



Renovation of sewer manholes

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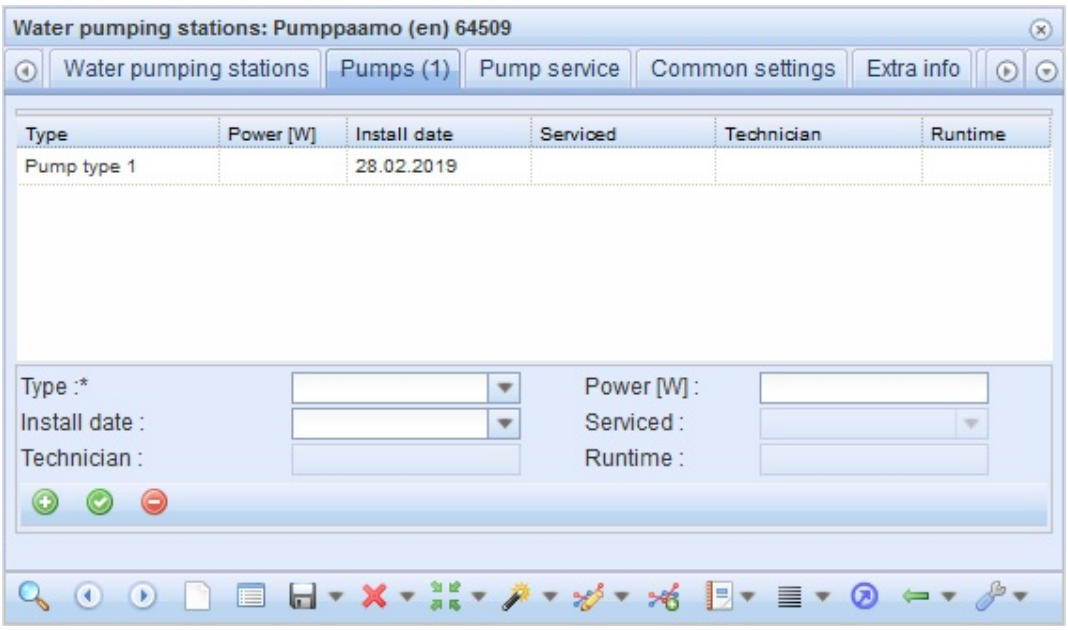
In addition to other property values, you can save renovation-related information for sewer nodes on the **Renovation** tab. You can store the following renovation information: **material**, **renovation method**, **renovation year**, and **coating thickness**. Regarding the renovation method, selecting **New manhole to old one** activates the field **Manhole diameter**, enabling you to enter the diameter of the new manhole (mm). Click **Add renovation** to save the data. Renovation information can be deleted by clicking **Delete renovation** .



Pumps at pumping stations

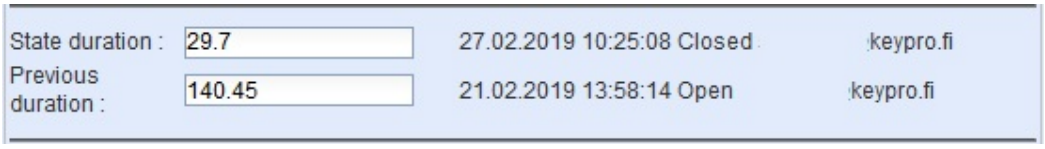
The properties of the pumps at sewer pumping stations and water pumping stations can be defined on the **Pumps** tab. The type, power, and installation date of a pump can be added. To add a new pump, click **Add pump** . All pumps added to the pumping stations are listed on the form. Existing pumps can be removed by clicking **Remove pump** . Changes made to the pump properties are saved by clicking **Update pump** . When you have added a pump to a pumping station, the **number of pumps** will be displayed **in brackets** after the name of the Pumps tab.

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Valve status information

Information on the duration of the state and the person changing the state is displayed on the form. Valves save information on the closing and opening times and, based on that information, calculate the duration of the period the valve was closed.



Valve state changes are entered in a log that can be viewed on a separate form. To open the form, click **Valve state log** on the **Water valves** form.



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MAINTENANCE AND REPORTING TOOLS

In KeyAqua, network objects create a network model and are thus used as the basis for the entire production process throughout its various phases, from network construction to fault repair and renovation.

The maintenance function can be roughly divided into the following functions:

- Error reports that can be associated with:
    - Repair measures
    - Maintenance measures
- Work programs that can be related to:
    - Repair measures
    - Maintenance measures
- Investigations
- State reports for water network nodes
- Quality reclamations
- State investigation for manholes

All of the above-mentioned functions include a function that allows you to add electronic attachments (files and links) to all objects. The objects related to maintenance functions can be highlighted or displayed on the map as themes, and various reports can be generated for them.

Error report

The **Error report** form is used to process various **malfunctions and customer notifications** that are logged in the system for possible further action. These reports can also be used as material when considering the overall condition of the network and possible repair and renovation measures.

A notification can be linked to a network object (duct, node tool or customer point), or it can be given a location on the map (linking to coordinates).

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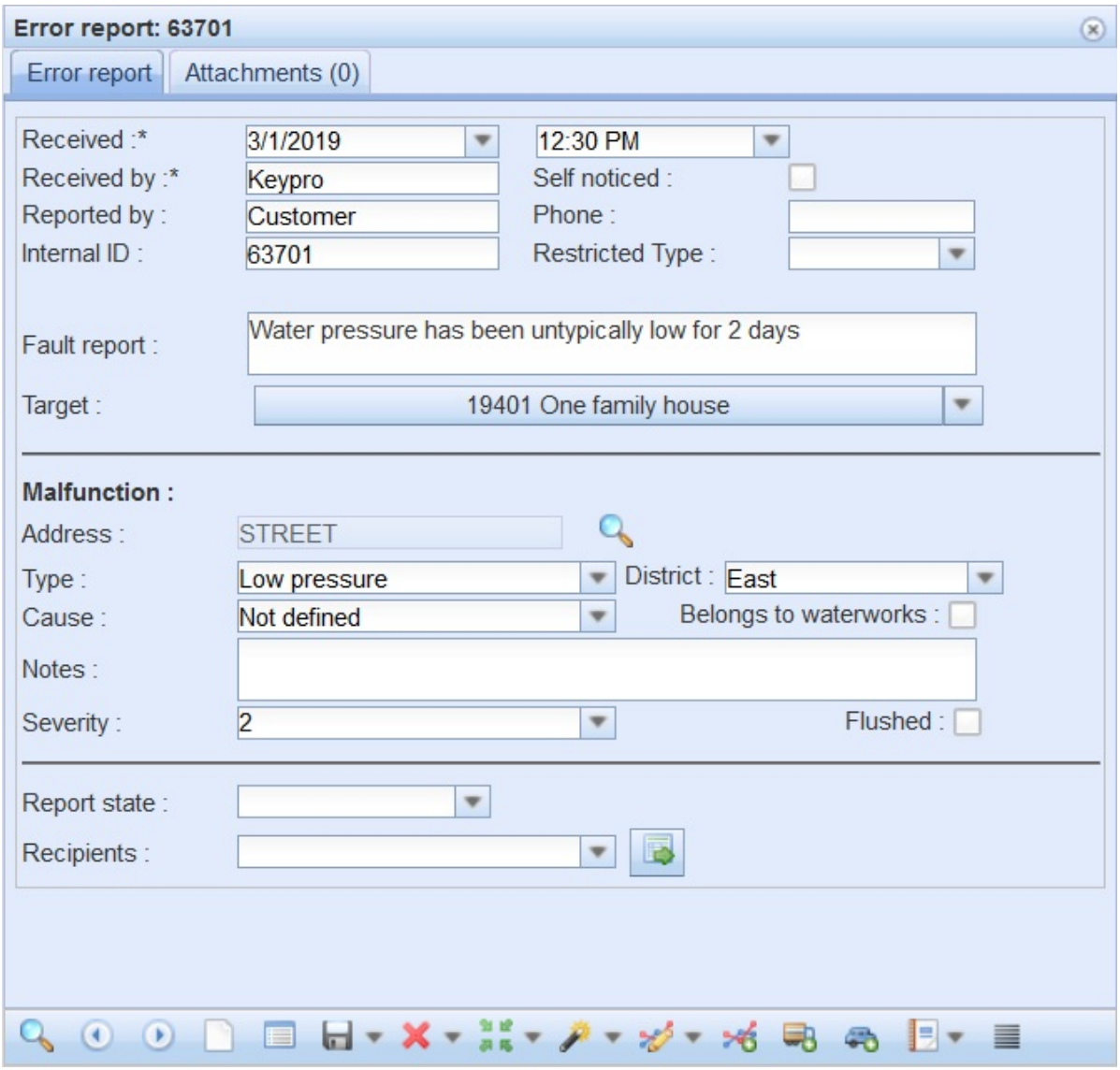
On the basis of the notification, the supervisory staff will investigate and decide whether the repair of the fault is the responsibility of the water and sanitation services. For example, service connections that housing companies are responsible for do not necessarily cause any actions to be taken. Although the correction of a disturbance is not the responsibility of the water and sanitation service company, the entry will remain in the system and it will be retained as history data in the system.

Error reports include status information that indicates whether the error report is still valid. All error reports will be retained after repair, so that they can later be viewed and included in the reporting. When planning maintenance and renovation operations, information on areas in which there have been, for example, several leaks and/or various faults is valuable information for the planning.

Click **Error report**  to open the **Error report form**. You can retrieve reports from the database using search criteria, update the data in the reports, and locate them on the map.

To create a new error report, **enter the property values on the form** and then click **Save form**  to save the report. Error reports can be used to save information related to the error report and malfunction type and quality.

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To link an error report to a network object (ducts and nodes for all networks), go to the drop-down menu for **Target** and select **Connect target.** On the map, click the object you want to connect with the left mouse button. The error report will be assigned a location either **when you save** the information or later with the **Create** function. The symbol indicates the location of the error report. The location can be changed using the **Modify** function.

Tip! You can link **either** a repair **or** maintenance measure to an error report; only one repair measure or one maintenance measure, not both. If necessary, the object can be linked to a work program.

The colour of the error report icon displayed on the map depends on the status of the error report:

Yellow – the error report has been received but it has not yet been investigated whether the defect must be repaired by the water supply service company.

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Pink – the water supply service company is responsible for the repair, but no repair or maintenance measures have yet been documented.

Green – the fault has been repaired or maintenance measures have been taken.

Repair measures usually require digging, such as in the case of leaking water ducts and collapsed sewer lines.

Maintenance measures include, for example, flushing of water ducts, opening of blocked sewers, and replacing manhole lids.

Based on the information in the error report, you can attach the object to a work program, such as a periodic flushing or the removal of tree roots. Incidents related to network objects are stored in the database, and users can view the incidents related to network objects (described in the chapter Events).

Sending error reports by email

Error reports can be sent by email to other users of the system so that they are immediately informed of the fault. The error report email contains a link that automatically opens the system and the error report form with the correct information (requires system log-in). To select more than one recipient for the error report from the **Recipients** list, click the names with the left mouse button while holding down the **Control** key. When you have selected the recipients, click outside the form to have the selected recipients displayed in the field in italics. To send the error report to the recipients by email, click **Send** .

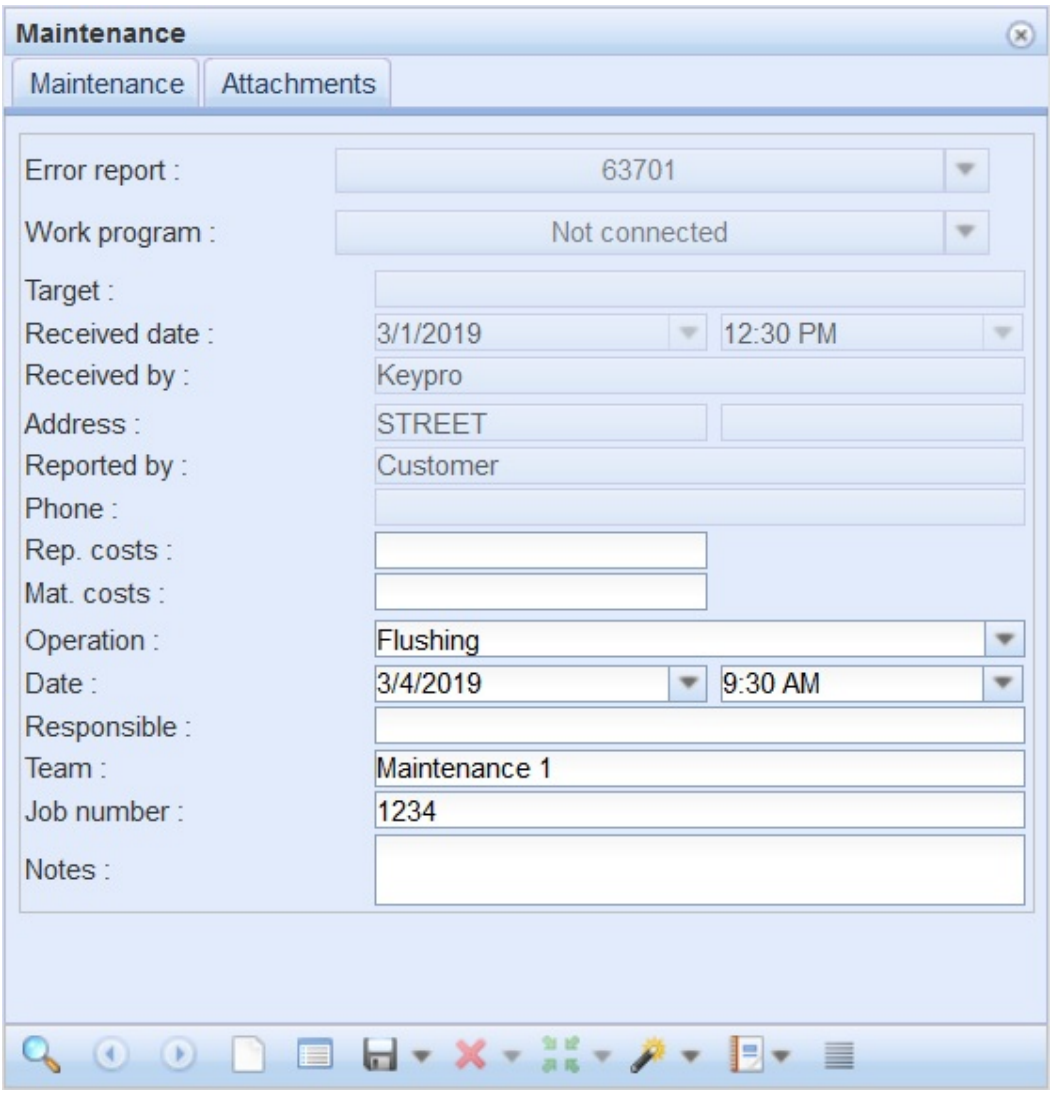


Maintenance

Maintenance measures include, for example, flushing of water ducts, opening of blocked sewers, and replacing manhole lids.

To add a maintenance measure to an **Error report** , click **Maintenance** on the form. This will open the **Maintenance** form. In the top section of the **Maintenance** form, you can see information on the error report that the maintenance measure is associated with and information on the network object to which the fault report has been linked. The form will be populated with information on the measures taken, the responsible person, and other details. When the form has been completed, click **Save form** to save the information.

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When you re-open the **Error report** form to which the **Maintenance measure** was linked, the **Repair** button with its related functions is deactivated on the form. This means that a maintenance operation has already been linked to the error report, and it is not possible to add a repair measure. To view the saved information on maintenance measures, click **Maintenance** .

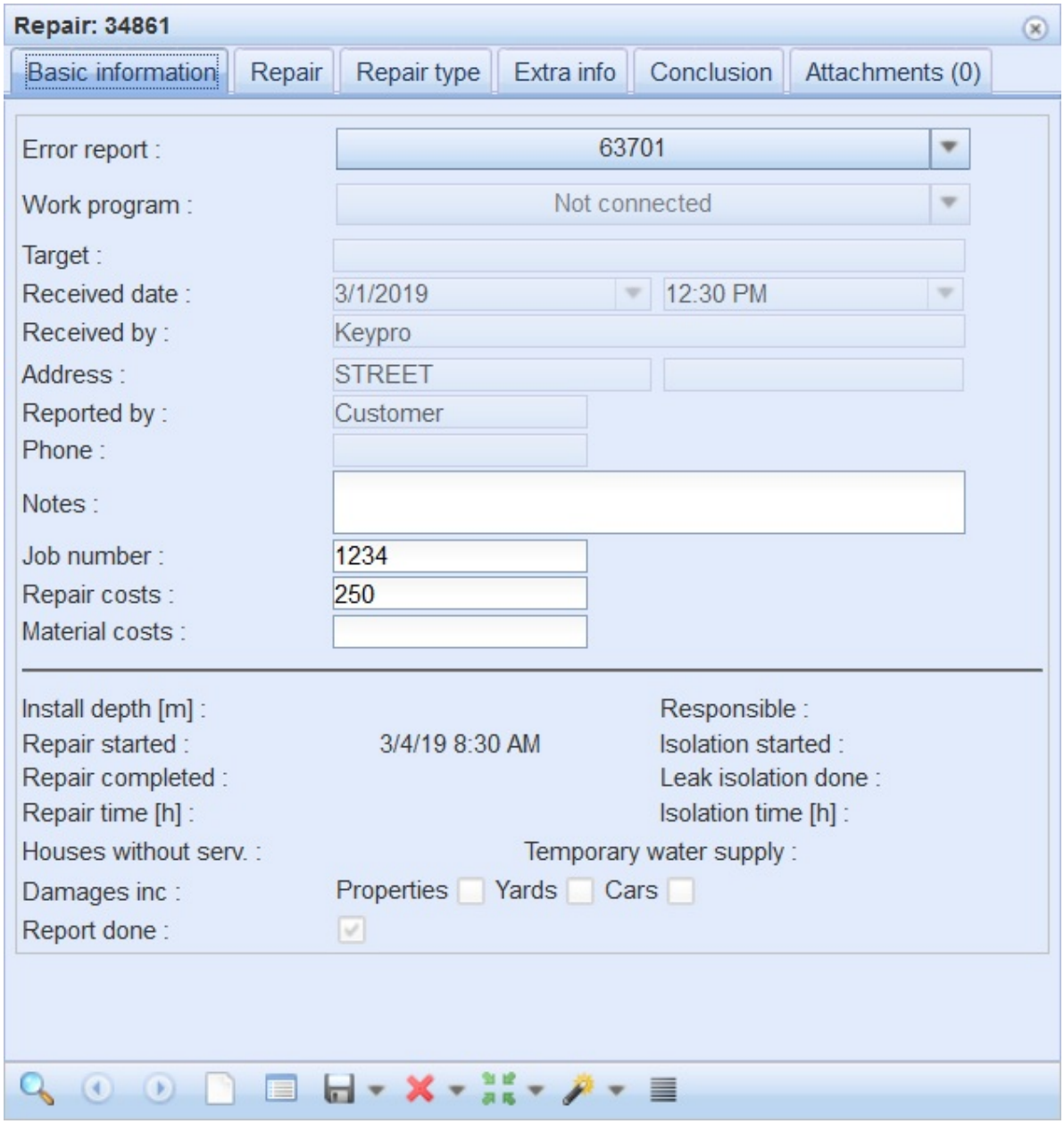
Alternatively, you can open the **Maintenance** form from the drop-down menu for **Reports** in the **KeyAqua** toolbar. You can retrieve maintenance measures to a form using the form fields. To open an error report related to the maintenance measure, click **Open** in the drop-down menu for **Error report**.

Repair

Compared to maintenance, repairs are more extensive measures taken in relation to a problem reported on an error report. To link a repair to an error report, click **Repair** on the **Error report** form.

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The **Basic information** tab includes summaries of the error report information (in the top section) and the repair measure (at the bottom). The central part of the form can be used to save additional information, the job number, and cost information.



Information on the persons carrying out the repair work (responsible person and team), the start and end time of the repair, and a free-form description of the repair measures are saved on the **Repair** tab. In addition, information on the repair, such as the location, repair surface, fill ground, and repair base, is recorded on the tab. This can be useful when planning repairs for this duct section in the future.

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Information about repair methods, such as the new duct material, duct junction, leak node (if any), precipitation and its quality, and the flushing of the line, is saved on the **Repair type** tab.

Details on the duct leak, such as a description of the leak (hole, crack, piece missing, cut) and the leaking element, leak cause, leak area, interruption in the water supply, the duration of the interruption, and repair type are saved on the **Extra info** tab. The **Conclusion** tab is used to save free-form information on the report creator and damage to facilities, yards, and vehicles. The due date for the Repair report can be defined and its sign-off can be completed on this tab. The **Attachments** tab is used to add documents (if any) related to the repair measures.

Adding maintenance/repair measures directly to an object

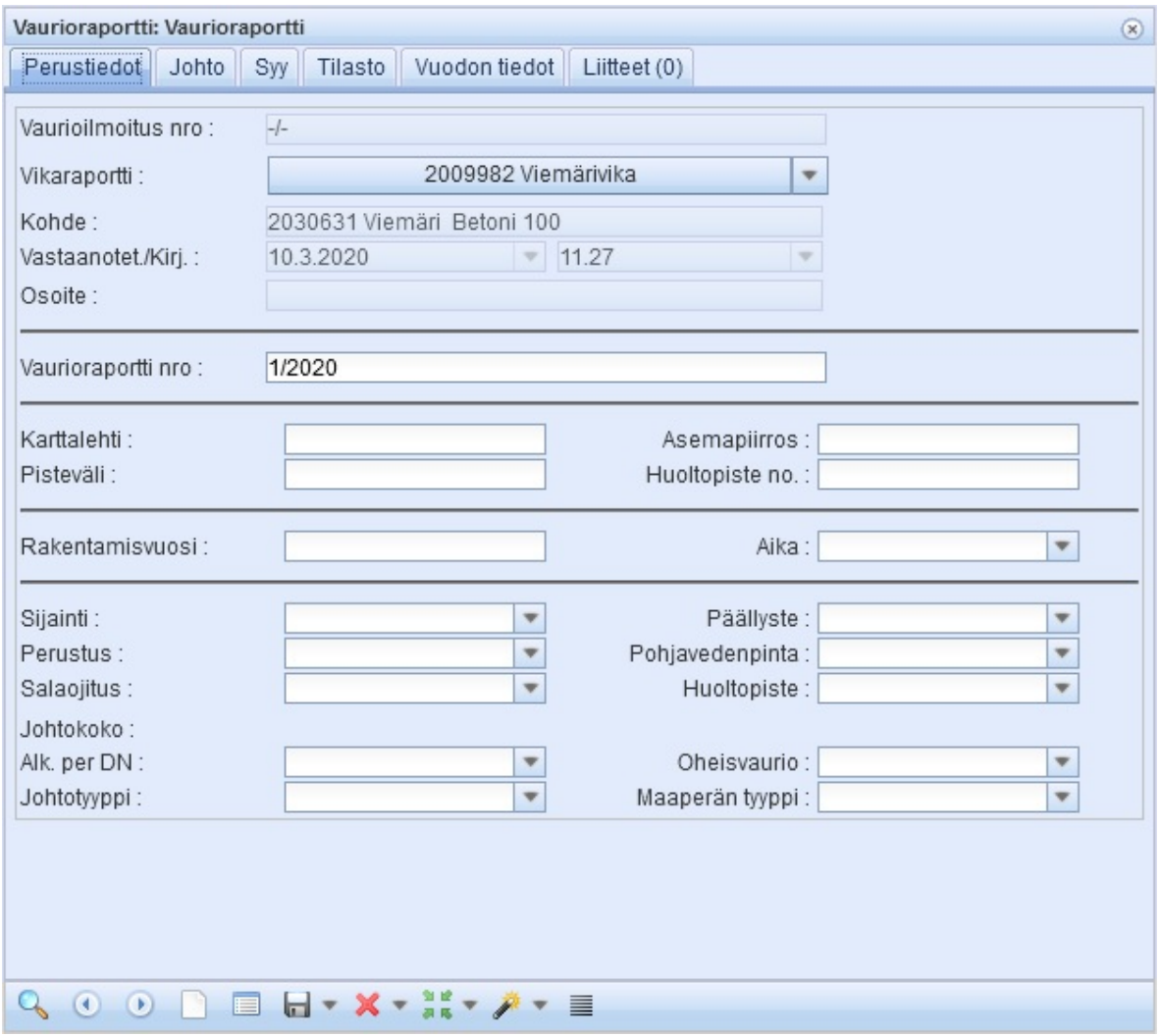
It is possible to add maintenance and repair measures to an object without having to create an error report or work program (see the Work Programs section for further information). This function is useful, for example, for planning and documenting the maintenance of individual node tools. To add a measure to a node tool-specific object form, select **Maintenance** or **Repair** from the drop-down menu for **Take to work program** or **Other tools** . This opens a form for the selected measure with pre-filled object information.



Failure report

Failure report form allows you to record information about the observed damage. A damaged network element can be, for example, a pipe, which can cause a leak. You can connect the failure report to the error report. On the **Reason** tab, you can provide detailed findings and the general and specific cause of the damage. On the **Statistics** tab, you can write down information related to repairs and procedures.

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Investigation

The **Investigation** form can be opened from the drop-down menu for the **KeyAqua** reporting tools. The **Investigation** carried out on the network objects is categorised as **maintenance**, **renovation**, **warranty and acceptance** investigations. The option **Undefined** is also available. Admin users can add new investigation categories to the system, such as maintenance and renovation, as well as sub-categories for them (such as state investigations).

The various investigation methods may include:

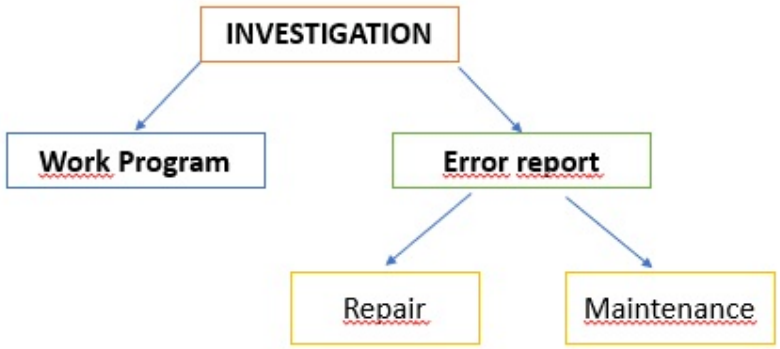
- Visual investigation (sensory perceptions related to the condition)
- Camera surveys
- Sampling
- Leak listening
- Pressure tests

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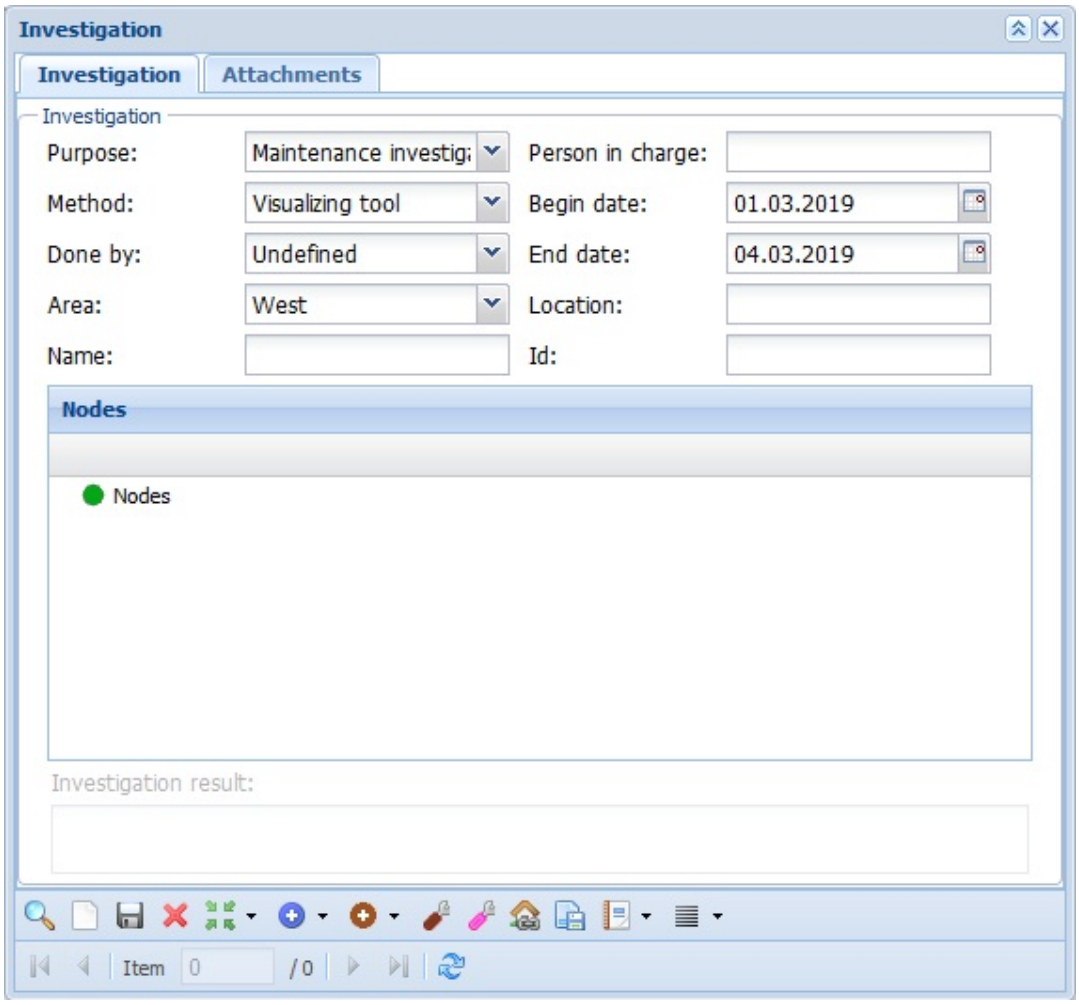
Network objects and customer points can be freely linked to an investigation. The network objects related to the investigation can be highlighted on the map. Users can attach various documents to investigations.

As a result of an investigation or inspection carried out on a network object, users can link the investigated object to a work program (maintenance, repair or renovation program) or, at the user's discretion, create an error report in the system and link the object to it. As a result of this, fault repair will proceed in accordance with the error report process.

In the figure below, the investigation processes.



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You can add network objects to an **investigation** with the **Add** buttons at the bottom of the form: **Water network** node or **Sewer network** node. There are two ways to add nodes:

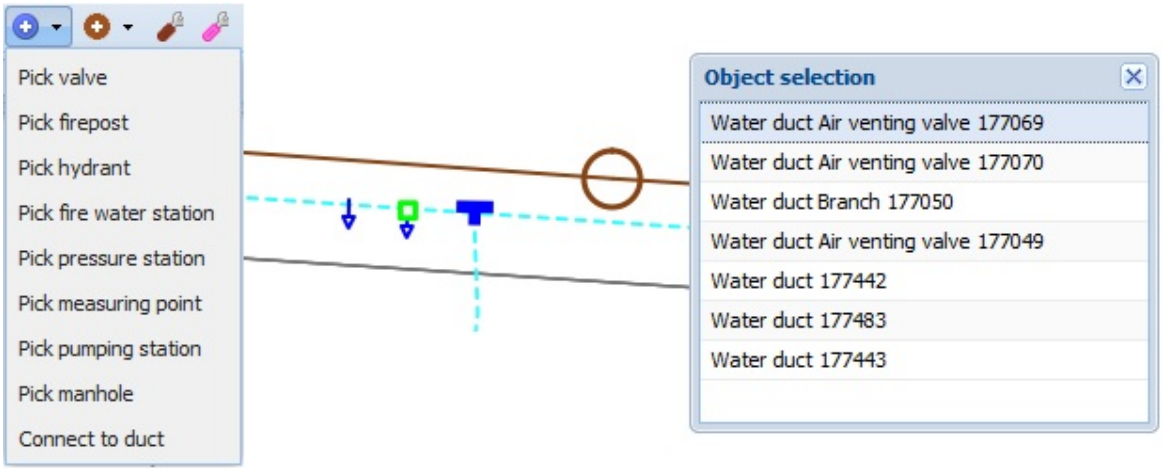
- Click **Add water network node** or **Add sewer network node** . On the map, click on the object you want to add to the investigation and select it from the list if there are multiple network objects in the location you are pointing at.

Or:

- Alternatively, open the object form from the drop-down menu for the **Add** buttons. To retrieve the correct object to the form, either use the search functions or pick the object from the map. To add the correct object to the **Investigation** form, click **Take to investigation** .

In the example figure below, on the left, using retrieval to a form (drop-down menu functions) and, on the right, selecting the object on the map using the Add water network node function.

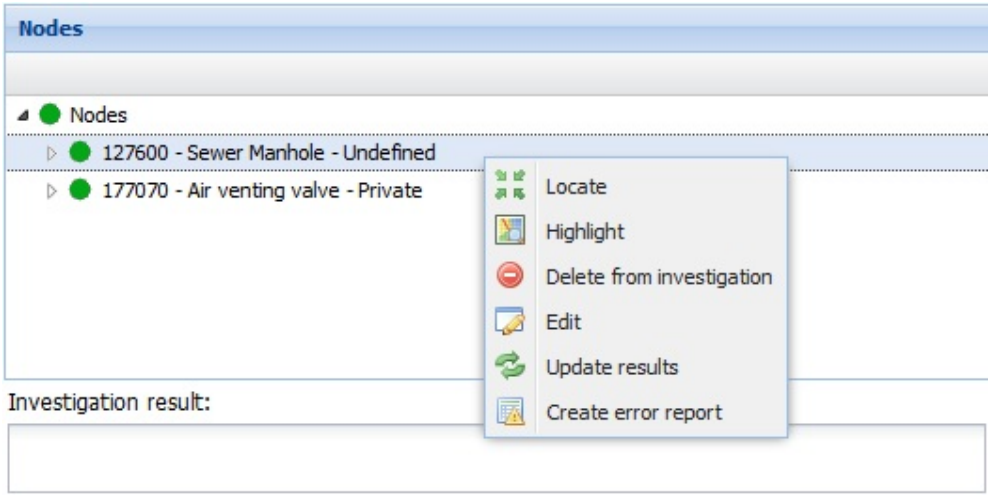
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Once the item has been added to the **Investigation** form, it will appear in the list of **Nodes**. Select the correct line in the list of nodes and click the right mouse button to open a menu with options. You can **locate** and **highlight** an object on the map or **delete** an object from the investigation.

The **Edit** function opens the object form, while the **Update results** function saves text in the **Investigation result** field. First, enter text in the **Investigation result** field, and then click the **Update results** button and **Save**.

Use the **Create error report** function to create an error report with the object's information.



Download WinCan

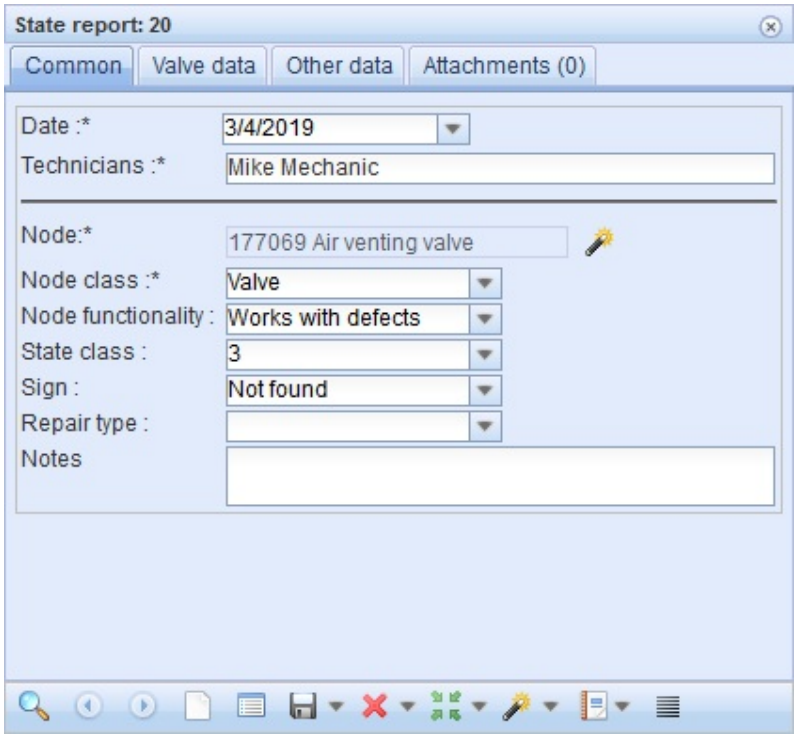
Use the **Download WinCan** function to create a text file in **WinCan** format for a **CCTV survey** of the investigation objects. The **CCTV** software can read the **WinCan** text file, which includes basic information on the manhole distances to be surveyed with a camera.

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State report for water network nodes

To open the form for creating state reports, click **State report** .

The **Common** tab on the form includes general information on the water network object on the form. Mandatory fields include Date, Technicians, Node, and Node class. You can enter text in free form in the **Technicians** and **Notes** fields, whereas other information can be completed using drop-down menus. Click **Save form** to save the state report information.



Select the equipment/node by clicking **Pick node** in the middle section of the form. Click the correct node on the map with your left mouse button. The ID and type of the node will then be displayed in the **Node** field. In addition, the location information for the state report will be updated with the location of the node that you add. **Click Locate** to center the map on the object in question.

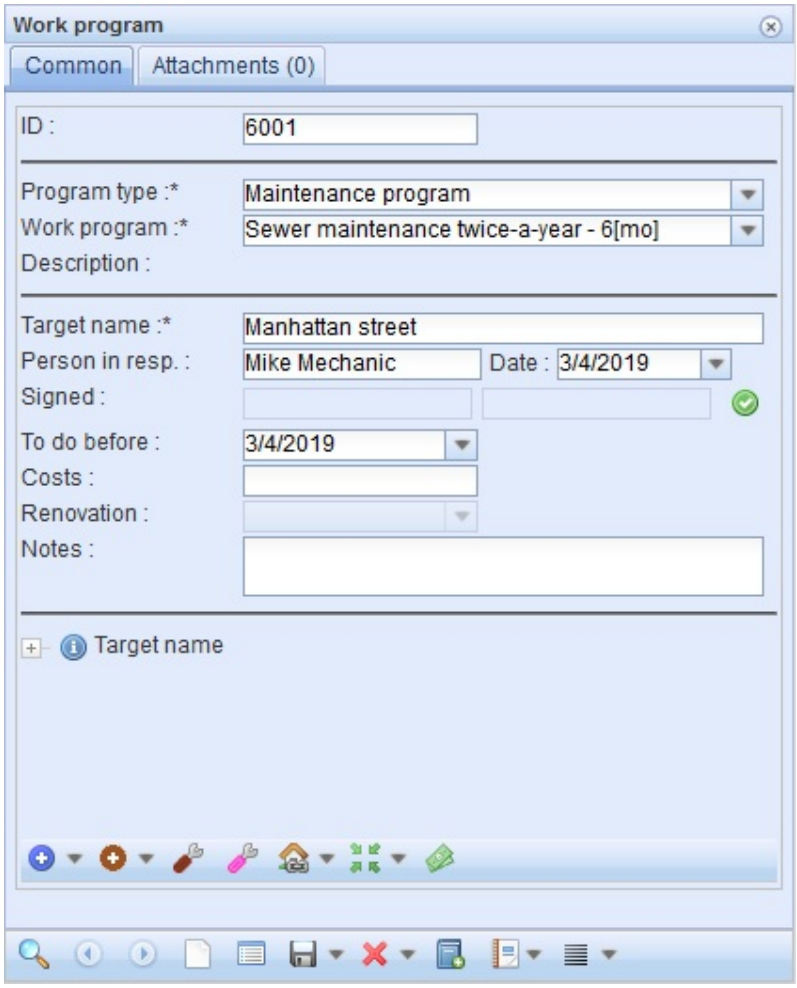
If the device to be processed with the form is a valve, then the **Valve data** tab will be completed with additional information on the condition survey. In the case of other nodes, information will be added to the **Other data** tab. Information on the properties and condition of the node is entered on both the **Valve data** and **Other data** tabs.

Work programs

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Work programs are created with the **Work program** form available under **KeyAqua Reports** . The work program form is divided into three parts. **The top section of the form includes general information on the work program:** a unique **ID** for the target; **Program type**, such as maintenance, repair, or renovation program, and more detailed information on the **work program** (such as flushing on an annual basis). More detailed information, such as details on the flushing, will be displayed in the **Description** field. The **work program** data is maintained on a separate **Work program types** form, on which admin users can add new work program types and work programs to the system. Adding new work program types is described in the chapter Adding work program types.

Maintenance programs include, for example, regular flushing and removal of roots. **Repair programs** refer to network objects awaiting repair but not requiring immediate action. Repair measures may be carried out, for example, in connection with other construction work. **Renovation programs** are related to network objects awaiting renovation. For example, network objects that will be renovated are added to future renovation programs.



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The **information in the middle section of the form** is usually related to a job that will be carried out in one go. For example, when there are several network objects requiring maintenance across an operating area, they can be grouped appropriately so that the work for each group can be carried out all at once. The **name of the target** can be, for example, a street name or the name of a particular area.

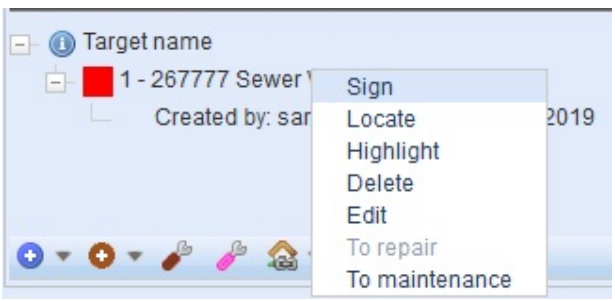
The middle section also includes fields for completing the **name of the responsible person** and the **date**. A **To do before** date for completing the work can also be defined. A separate **Signed** button can be used to confirm that all work has been carried out. With this, all work related to the associated network objects will be marked as completed. Furthermore, the date in the **To do before** field will be updated for work that is performed at regular intervals, with the new date set in accordance with the interval specified for the work program. For **renovation programs**, you can store information about the renovation method. In addition, you can provide further details and information on the total costs.

TIP: To confirm the completion of work related to an individual target through the target list, click the correct row with the right mouse button and select **Sign**.

The bottom of the form contains a list of the network objects added to the work program in question. Network objects are added in a similar manner to adding network elements to an **Investigation** (see the Investigation chapter).

The target's **sequence number**, **ID**, **type**, and **owner** are displayed. To see who added the object and when, and to view the most recent confirmation, click the ⊞ icon next to the object's name. Right-click on the correct line to locate or highlight the object. Click **Locate** to center the map on the object in question. If you have highlighted all the associated ducts and nodes on the map, you can click **Highlight** to highlight an individual object so that you can distinguish it from the others. You can **delete** a target from the work program or click **Modify** to access the network object form.

In the example figure below, an object added to a work program and the selections related to it. Red colour refers to non-signed target.

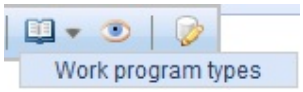


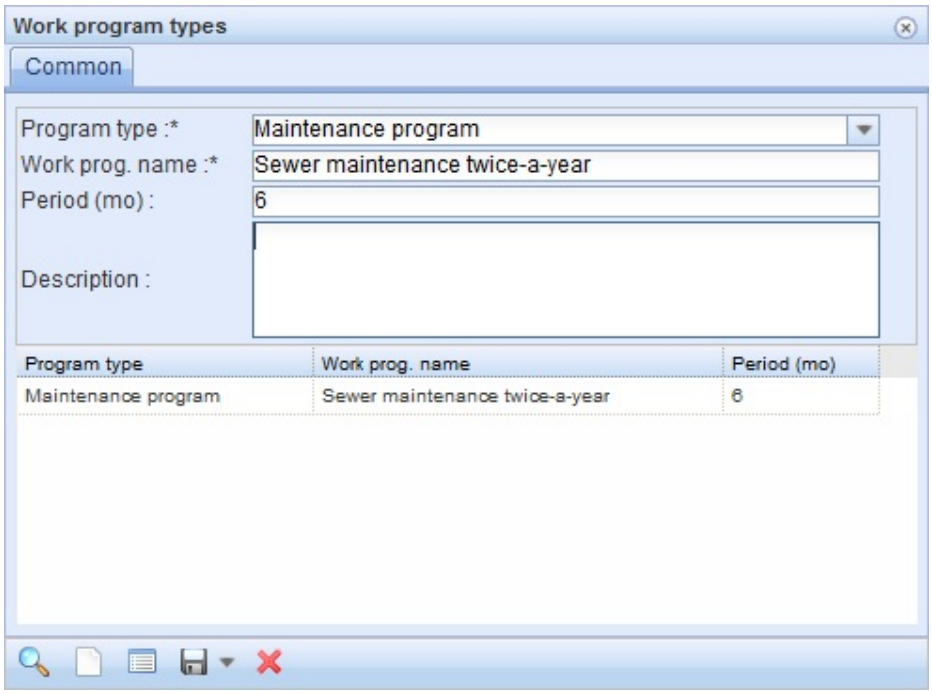
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You can add repair measures to repair program objects and maintenance measures to maintenance program objects. Repair measures are described in further detail in the chapter Repair and maintenance measures in the chapter Maintenance. If maintenance and repair costs have been saved for the objects' maintenance and repair measures, the **Count costs** function on the form will calculate the total cost of all objects added to the work program. This sum will be displayed on the **Work program** form in the **Costs** field. The general buttons on the work program form, such as object browsing, locating, and saving, work in the same way as on any other form.

Adding a work program type

Work programs can be added in the system using the **Work program types** form. To open the form, go to the toolbar and the drop-down menu for **Work program**, and select **Work program types** or click **Work program types** on the **Work program** form.





Quality reclamations

Click **Quality reclamation** to open the form for processing quality complaints. Information on the address, issue, discovery, actions, and samples taken and conclusions will be collected on this form.

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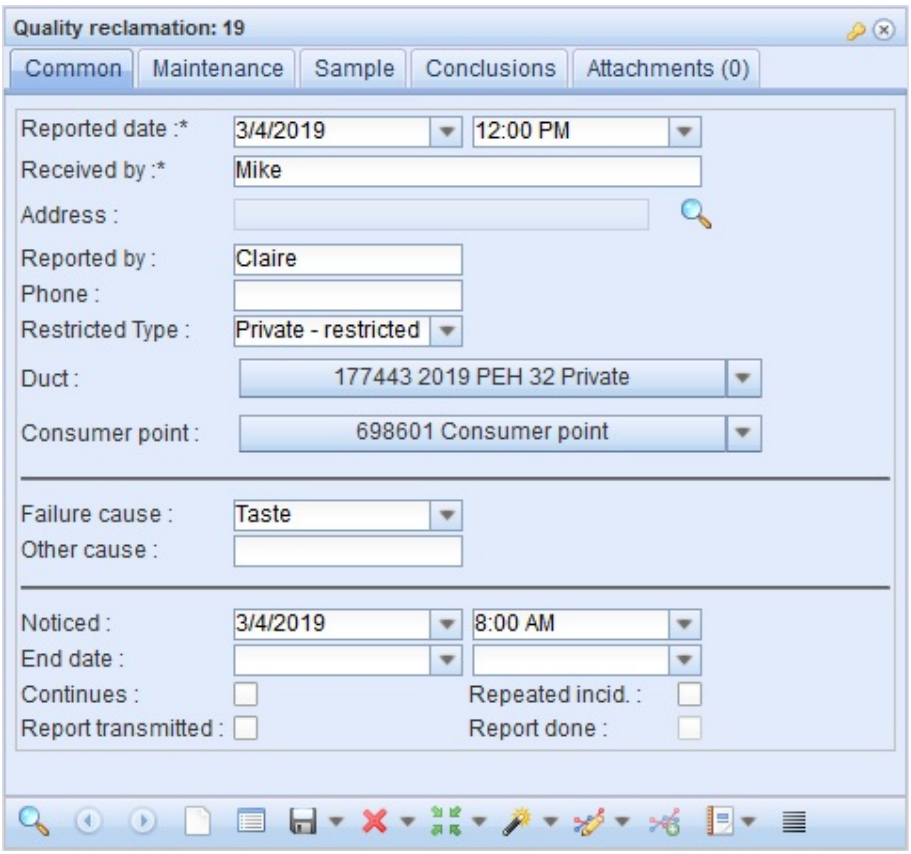
The **Common** tab of the form includes general information on the quality reclamation, such as who reported it, what the cause of the complaint is, and when the observation was made. **Reported date** and **Received by** are mandatory fields. Quality reclamations can be linked to ducts, such as service lines, by selecting **Connect to duct** in the menu for the **Duct** field. This will link a specific part of the network to the quality reclamation. For example, the address of the person filing the quality reclamation can be saved using the **Search** button. The address is retrieved from the address register using the **Address** form that is displayed. This is done either by using the form's search criteria or by pointing at the address on the map (the **address layer** must be active).

You can specify a **Consumer point** for the quality reclamation. In the menu for **Consumer point**, select **Connect to consumer point**. Select a consumer point on the map. Please note that the Consumer point layer must be active in **Layers**.

You can add the cause of the complaint, document other causes and observations, and add information related to the report’s status, time, and dates.

Location information can be added to quality reclamations using the **Create** function. This also creates a geometry and an icon, which can be located and highlighted using the **Locate** function on the form.

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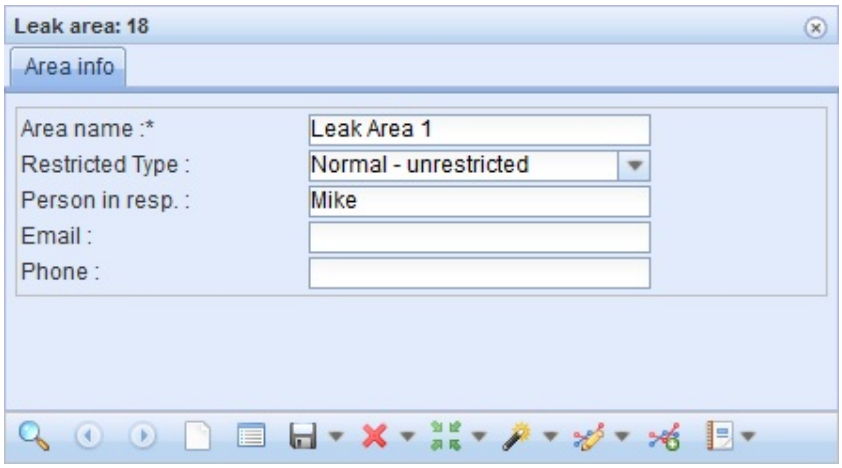
The **Maintenance** tab is used to record the visit time, the flushing procedures and methods that the customer has performed, and flushing-related information related to the reclamation. The tab can be used to save **the meter reading** before and after the flushing, and information on whether the customer will be compensated for the water used for the flushing.

Sampling-related information is recorded on the **Sample** tab. The **Conclusions** tab is used to record conclusions on the cause of the disturbance and the date on which feedback has been sent to the customer, in addition to which information related to returning the report is recorded on this tab.

Leak areas

Use the **Leak area** function to provide area information that partly determines who is responsible for the faults and repairs in the area in question. There can be an unlimited number of areas.

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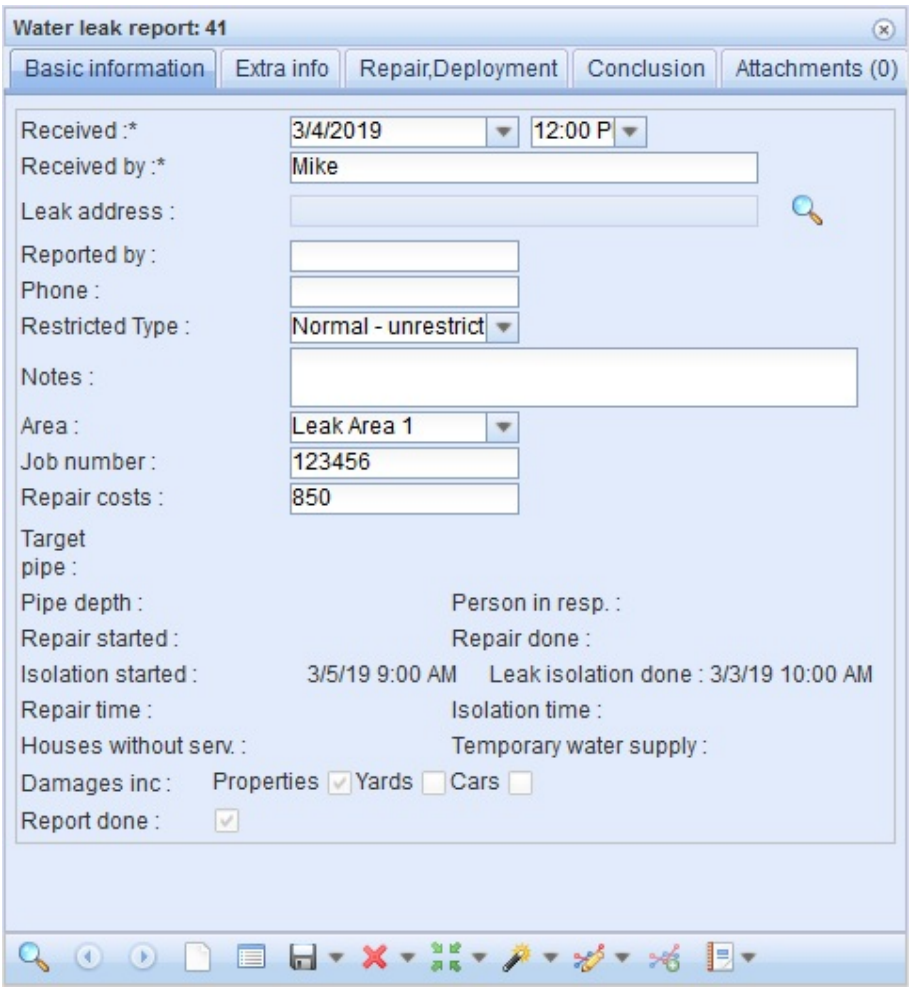


Water leak report

The **Water leak report** tool is used to save detailed information on leaks in water ducts and the related repairs and further actions.

- **Basic information**: includes, for example, the name of the person who received the information and the time of receiving it, leak area, the name of the person who reported it, the job number, costs, repair time, and the time the report was completed.
- **Extra info**: includes, for example, a description of the leak area, information on the leaking element, the cause of the leak, and the repair area.
- **Repair, Deployment**: includes, for example, information on the person and team responsible for the repair, repair time, isolation, temporary water supply, repair method, precipitation, and flushing.
- **Conclusion:** includes, for example, information on damage to buildings, yards, and vehicles, and the author of the report.
- The **Attachments** tab can be used to attach images and documents related to the water leak report.

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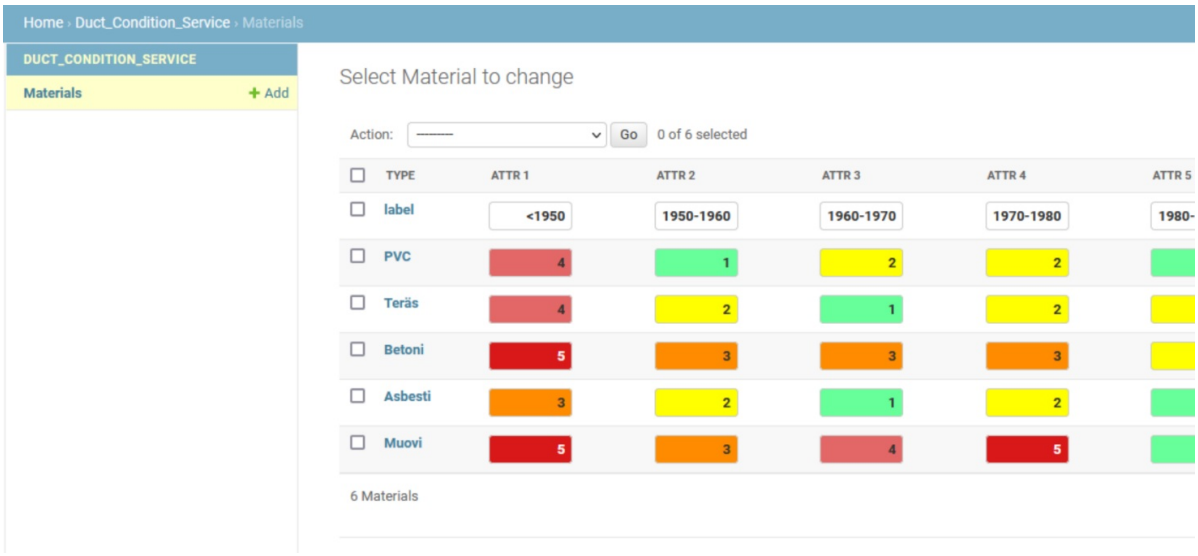


Duct condition information (this function is subject to a separate order)

The **Duct condition information** tool is used to document the condition values of the ducts. It is a service that allows the tenant/customer to edit their own assessment of the condition of the ducts in the admin user interface. The estimated condition of a particular duct is based on its material and year of installation. For example, a PVC duct installed in 1980 would receive a certain condition value.

The condition value of the duct gives an idea of when the duct should be repaired or replaced with a new one. Possible **CCTV** coverage and the values of the **Water Balance calculation** may provide additional information. The service offers a REST API for querying the values of the interface using the year of installation and the material of the channel as query parameters.

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CUSTOMER/CONSUMER POINT TOOLS

Customer/Consumer point tools	

The **Customer** and **Consumer point** forms are used to process information related to customers and the consumer points. This section describes the content and functions of the **Customer** and **Consumer point** forms in relation to viewing information.

If the **KeyAqua** system includes a billing module, customer and consumer point data is maintained using the **KeyAqua** functions. If the Customer uses some billing system other than **KeyAqua**, information can be transferred to the **KeyAqua** system for viewing, in which case updating it is not allowed. An exception to this is the location of consumer points, which can be specified within the KeyAqua system, but the location data will not be automatically transferred to other systems.

You can use the following buttons to open the tools related to managing customers and consumer points:

- **Customers**
- **SMS Sending**
- **Adding meter readings to the system**
- **Edit meters**
- **Consumer point**
- **Consumer point users**
- **Unconnected real estate**
- **Join point statements**
- **Buildings**
- **Junction**

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Customer

To open the **Customer** form, click **Customer** . The **Customer** form is used to view customer information and the customer's consumer points. To see the customer information for a consumer point, click **Export customer** .

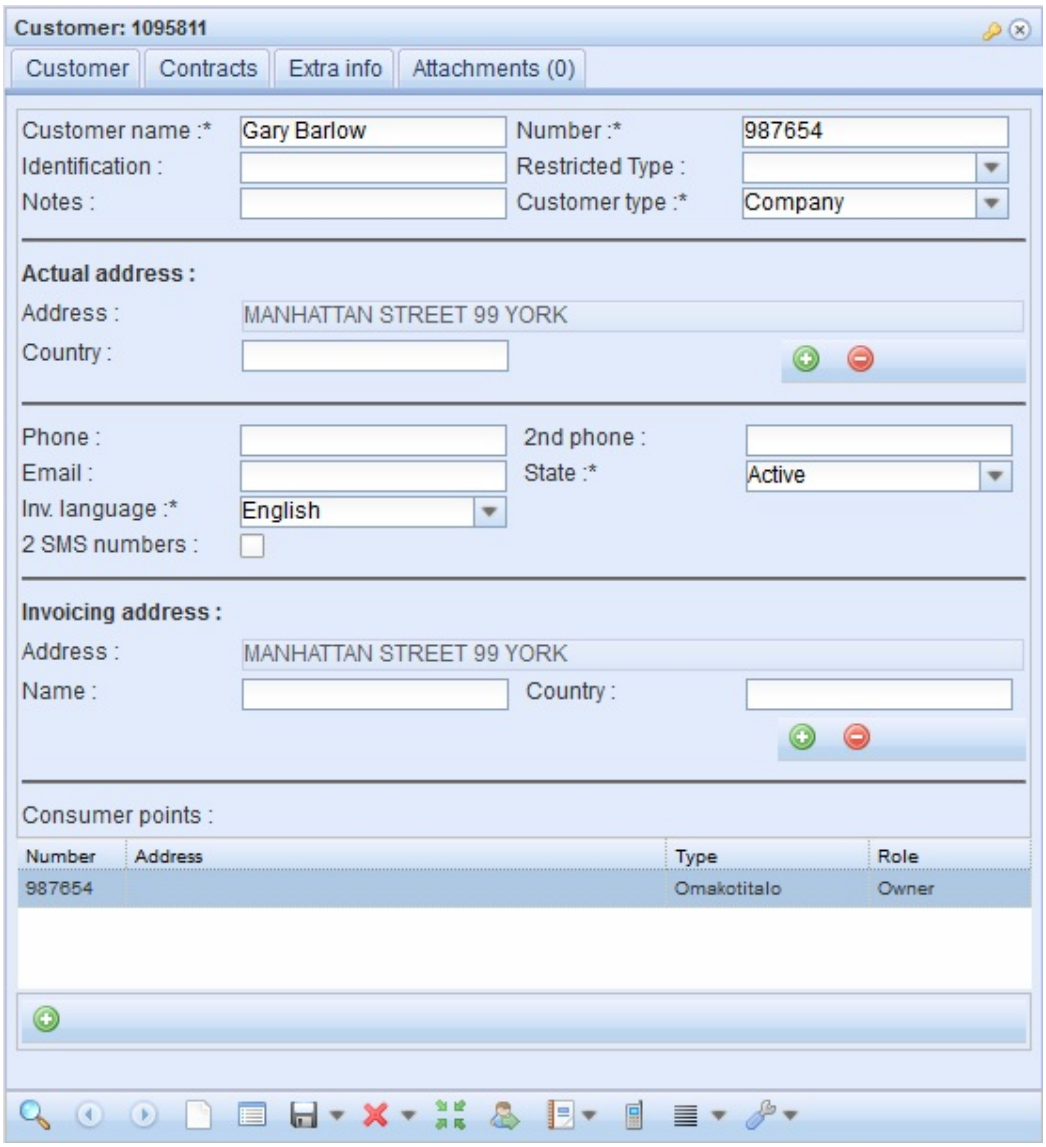
Customer information

The **Customer** tab is used for processing the name and contact details of the customer. In addition, the consumer points related to the customer are listed on the tab. Information transferred from some other billing system of the customer is displayed in grey in the read-only fields on the form and cannot be modified.

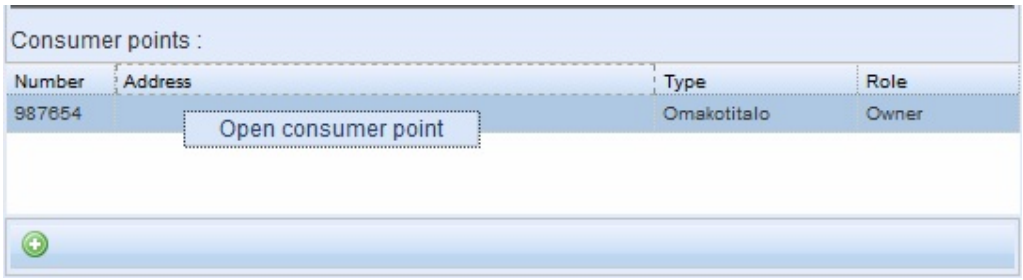
You can search for objects using the form fields. Clear the form by clicking **Clear** the bottom of the form, then enter your search criteria in the form fields and perform a standard search by clicking **Search** .

You can save two different phone numbers for the customer. If both numbers are used for **SMS Sending**, select the checkbox for **2 SMS numbers**. The SMS service is discussed in more detail in the section SMS Sending (a function subject to a separate order).

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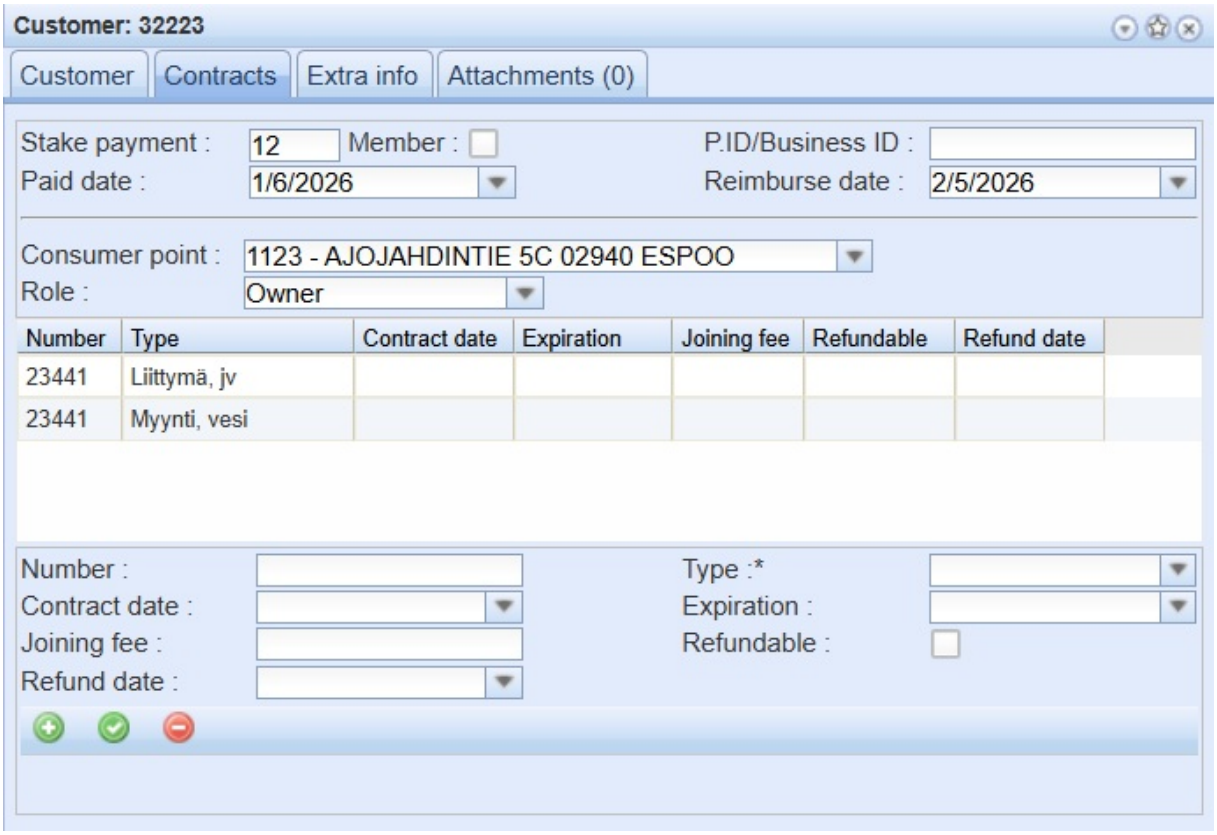
To open the **Consumer point** with the customer's consumer point information, right-click the consumer point in the list at the bottom of the **Customer** form. To add a consumer point to the customer, click **Add new consumer point** .



Contracts

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The **Contracts** tab in the **Customer** form is used to manage the contract related information associated with a customer and their consumer points. This tab displays existing contracts, allows the creation of new contract entries and modify existing ones. Contract information is customer-specific and may also be tied to individual consumer points when applicable.



The top section of the **Contracts** tab contains general contract-related information for the customer. These fields are used to record payment details, membership status, and identification data:

- **Stake payment & Paid date**: Used to record whether the customer has paid a stake or participation fee and the date on which the payment was made.
- **Member**: Indicates whether the customer is considered a member.
- **P.ID / Business ID**: A field for entering the customer's personal identification number or business ID.
- **Reimburse date**: Used to record the date when a reimbursement related to the customer's contract or payments was processed.

The lower-top section is used to link the contract to a specific consumer point and to define the customer's role in relation to it:

- **Consumer point**: Allows you to select the consumer point associated

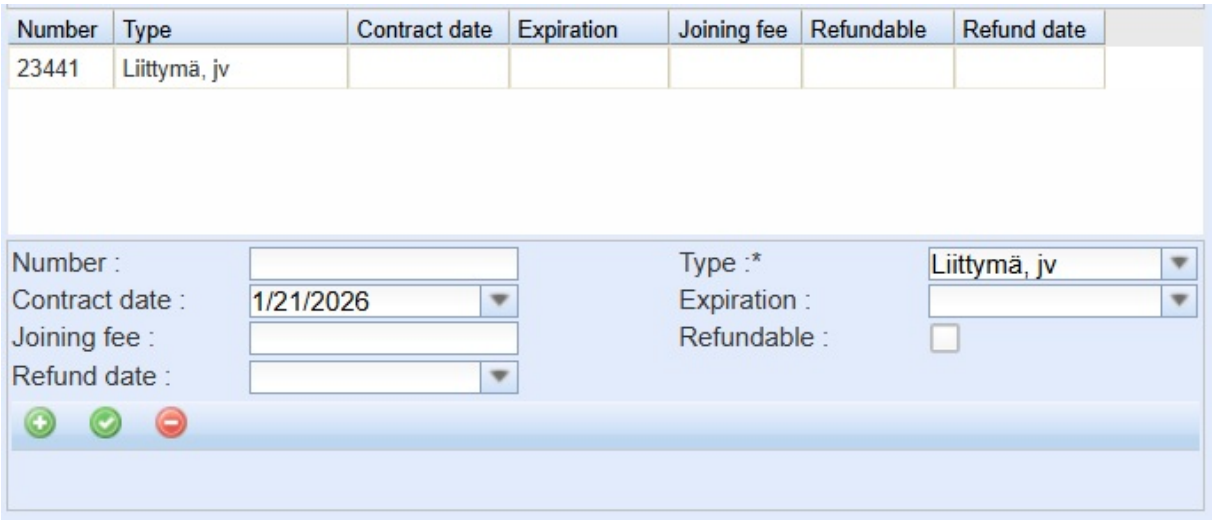
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with the contract. The dropdown displays only the consumer points already linked to the customer.

- **Role**: Specifies the customer's role for the selected consumer point.

Contract details

When creating a new contract or editing an existing one, use the fields and buttons under the grid:

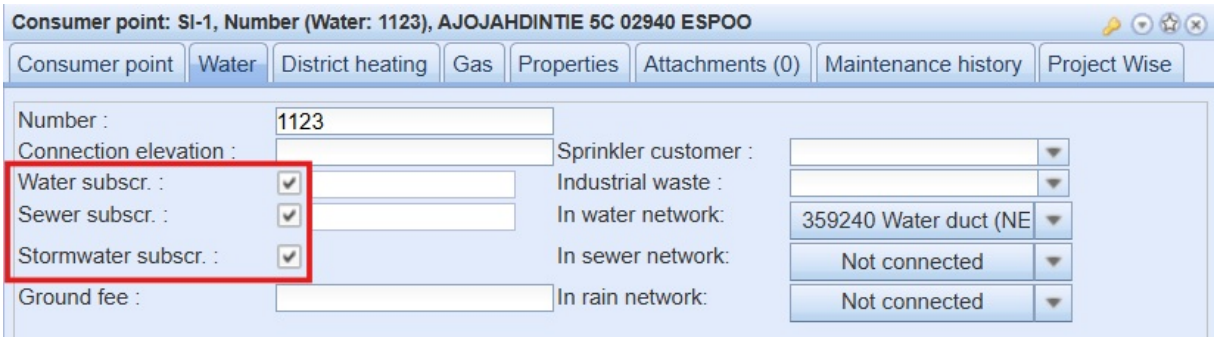


- **Number**: Unique contract number or identifier.
- **Type***: The contract type. **(This is a required field (*))**.
- **Contract date**: The date the contract becomes valid.
- **Expiration**: The contract's expiration date, if applicable.
- **Joining fee**: Record any joining or activation fee associated with the contract.
- **Refundable**: Select this checkbox if the joining fee or part of it is refundable.
- **Refund date**. Date on which a refundable amount was returned to the customer.

The **Add contract** button creates a new contract entry, the **Remove contract** deletes the selected entry, the **Apply changes** button stores any changes made to the selected entry.

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Note! Adding a contract requires that the corresponding network type is activated on the consumer point's Water tab. For example, the **Water subscr**, **Sewer subscr**, or **Stormwater subscr** checkbox must be selected before a contract related to that can be added.

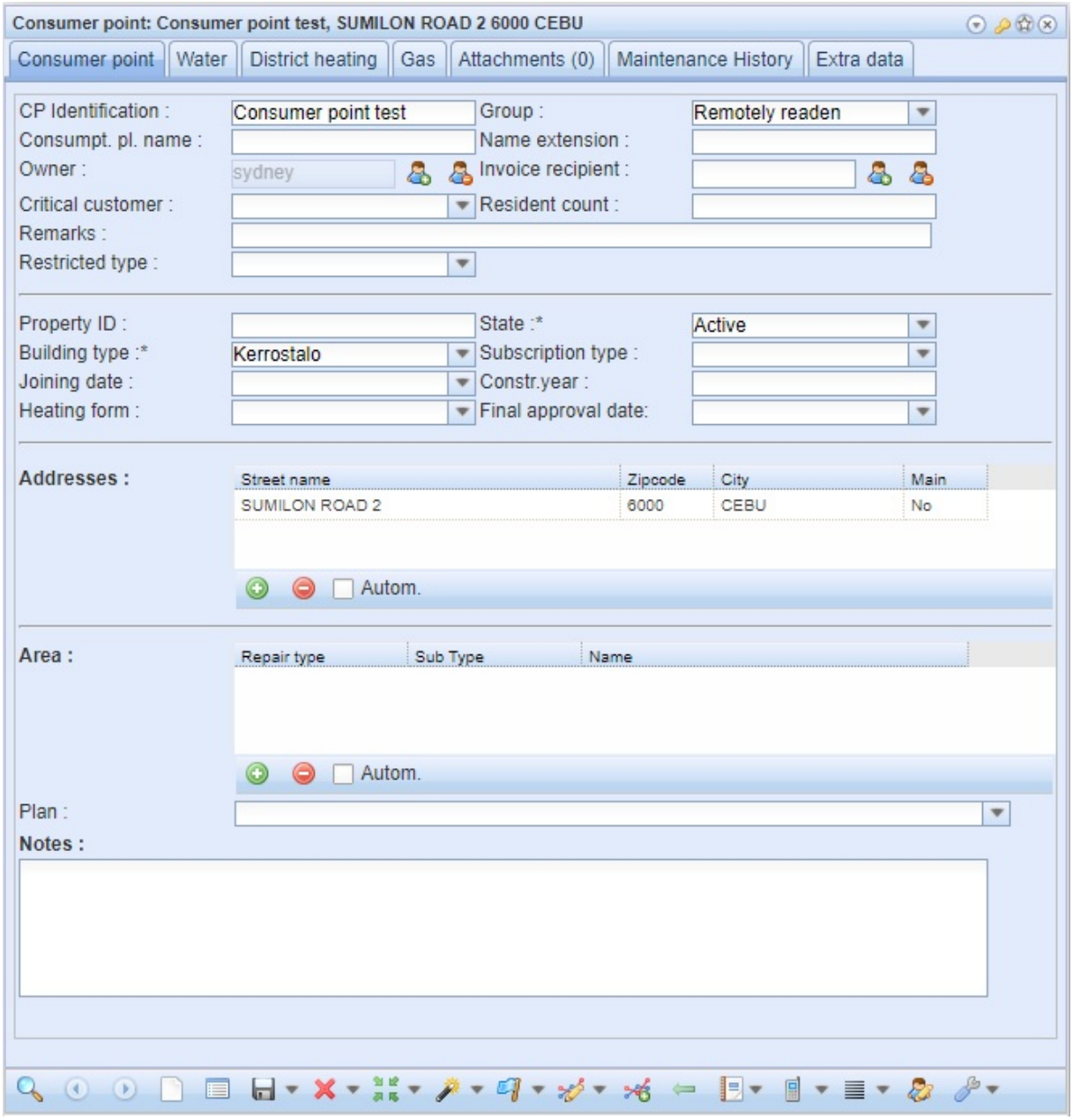


Consumer point

The **Consumer point** form can be found in the **Customer/Consumer point** menu. The **Consumer point** form is used to change the location and property attributes of consumer points and also create new consumer points manually on the map. From the **Consumer point** form, you can access the **Customer** form in order to retrieve information on the owner and the invoice recipient.

The functions of the buttons displayed at the bottom of the **Consumer point** form work in the same as any other form in **KeyAqua.** In other words, the buttons function in the same way as described in GENERAL FUNCTIONS OF THE OBJECT FORMS. The buttons that are displayed depend on the **user's privileges**. For example, read-only users cannot update information. If a button is dimmed, it is currently unavailable.

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Consumer point information

The **Consumer point** tab is used for processing the information of the consumer point. In addition, the consumer points related to the customer are listed on the tab. Information transferred from some other billing system of the customer is displayed in grey on the form in the **read-only** fields and cannot be modified.

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Alert! Profinder user!

If you select **Profinder** as the **Building type,** the consumer point will be deleted automatically when the **Profinder** updates the consumer information in the system. This happens weekly if you have **Profinder/KeyAqua** integration in use. If ther **Building type** than **Profinder** it will appear blue on the map and wont be deleted by the system.

Manually creating a consumer point

You can create consumer points manually in addition to having them imported to the system by Keypro.

1. Open the **Consumer point** form.
2. Start by filling the mandatory information's fields marked with the "*" symbol in the Consumer point tab.
3. When you have added the desired information, click **Create** to start defining the location of the object.
4. Create a new object by left-clickling the desired location on the map.
5. **Save** your changes.
6. You can later update the information by changing the information on the form and the clicking **Save** .

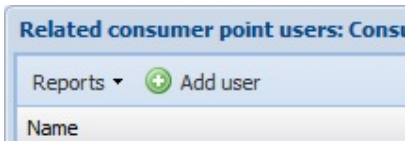
Contact information for the consumer point

To add contact persons for a consumer point, use the **Owner** and **Invoice recipient** fields. With the **Select owner** and **Select invoice recipient** options, you can select the **Customer** for the consumer point. You can view customer information using the **Open customers** button. You can give a consumer point a “**critical**” status. To do that, select **Yes** in the drop-down menu for **Critical customer**. Users and contacts for a consumer point can be added from the **Other tools** drop-down menu by selecting **Show consumer point users** or **Show contact persons** .

Users of a consumer point

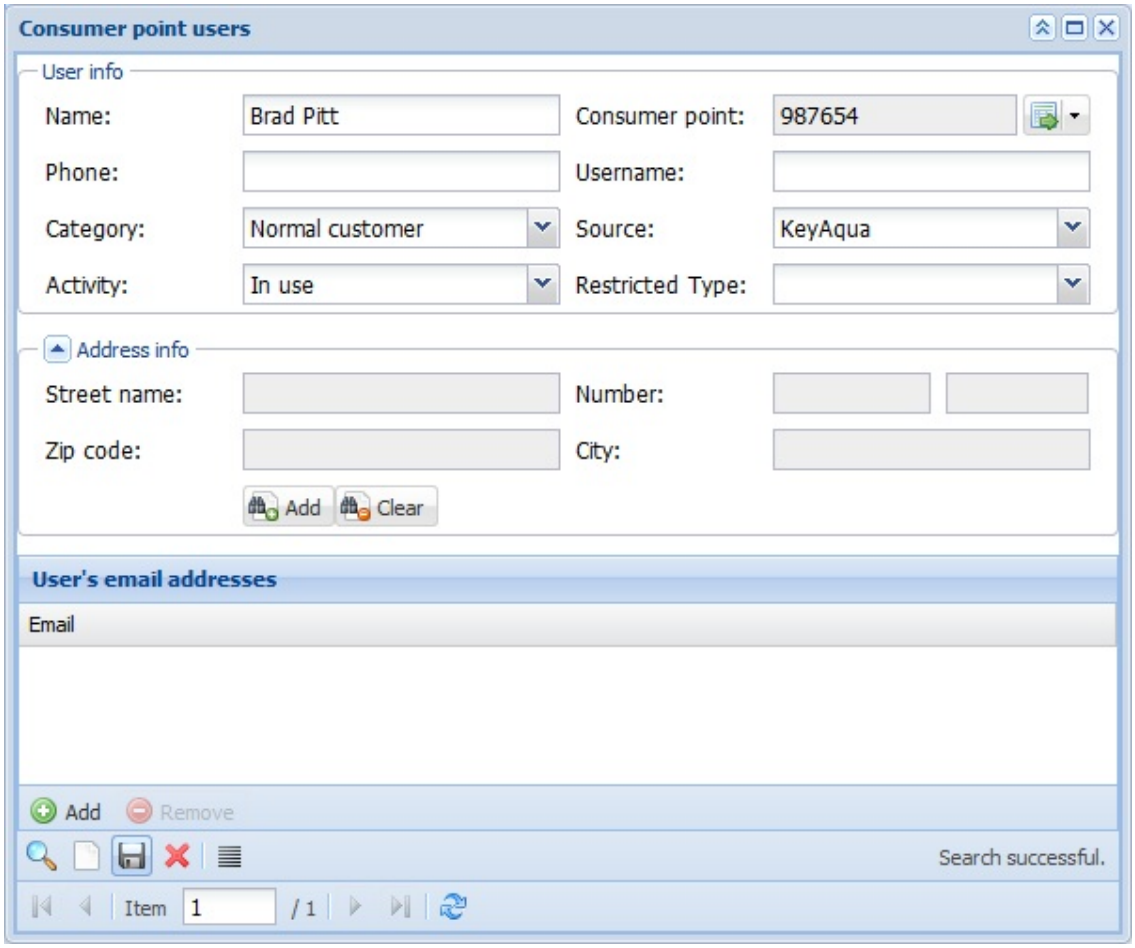
You can add the users of a consumer point by selecting **Show consumer point users** from the drop-down menu for **Other tools** . You can add and view the users of a consumer point on the form that is displayed.

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Click **Add user** to open the **Consumer point users** form, on which you can complete the user and address information. **Save** the form.

Note! The number of the consumer point will be automatically displayed for a consumer point user when any value has been entered in the **Number** field on the **Water** tab of the **Consumer point** form.



Click **Refresh** to update the **Consumer point users** list with information on the users of the consumer point. You can use the **Report** tool to create a **List report** of the consumer point users.

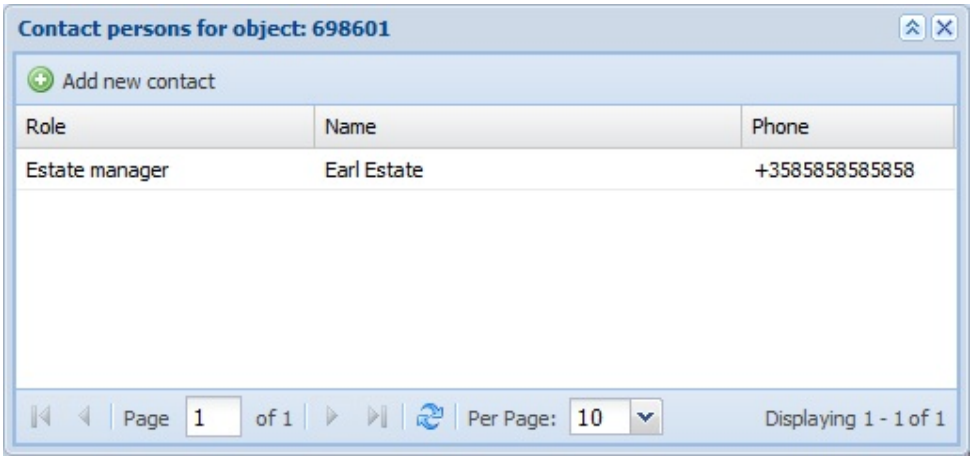
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Show contact persons

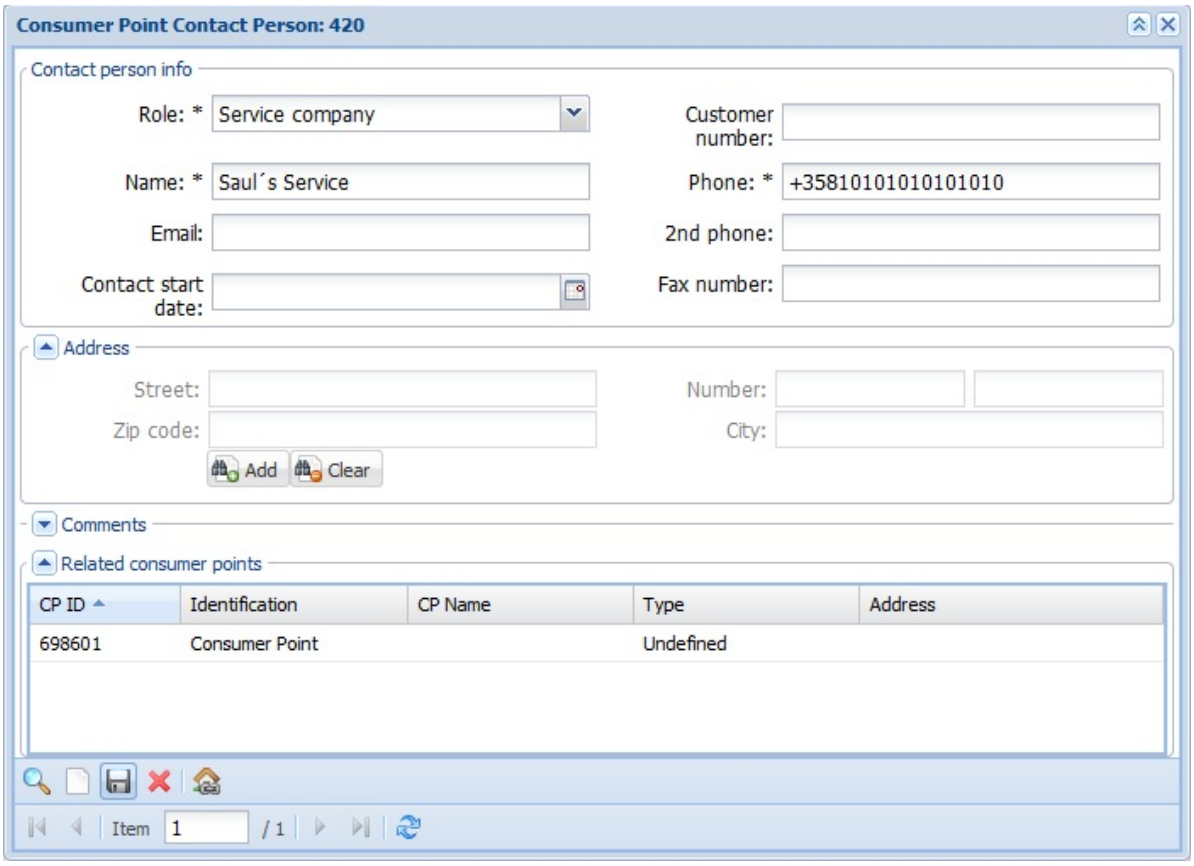
Contact persons for consumer points, such as caretakers and maintenance service companies, can be added by selecting **Show contact persons** in the drop-down menu for **Other tools** . You can add and view the contact persons for a consumer point on the form that is displayed.

Click **Refresh** to update the form with the contact person information you added.



Click **Add new contact** to open the **Contact persons for object** form. You can complete the form with the information and address of the contact person, comments, and consumer points. Complete the mandatory fields marked with an asterisk and click **Save**.

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Click **Add this contact to the active object** to add the contact person to the consumer point. You will be asked to confirm that you want to add the contact person to the consumer point. **Save** the form.

Consumer point users

Consumer point users are not the owners or managers of the consumer point. They are, for example, tenants or other members of the family. The **Consumer point users** form can be found in the Customer/Consumer point menu. The form can be used to add, import, edit, and delete contact information associated with the consumer point users. Contact information for consumer point users is also added and deleted through the **Customer Registration Site** (this function is subject to separate order). More in a paragraph

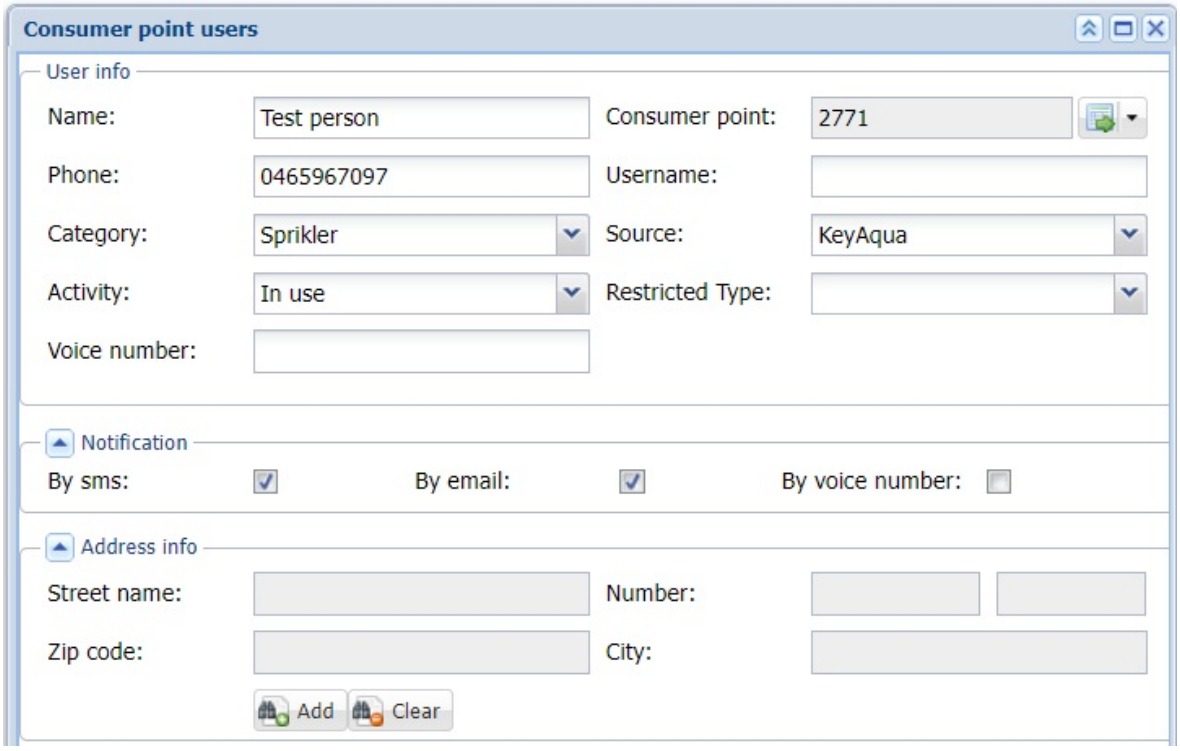
Adding a consumer point user

If you've started adding consumer point users through the **Show consumer point users** button from the **Other tools** of the **Consumer point** form:

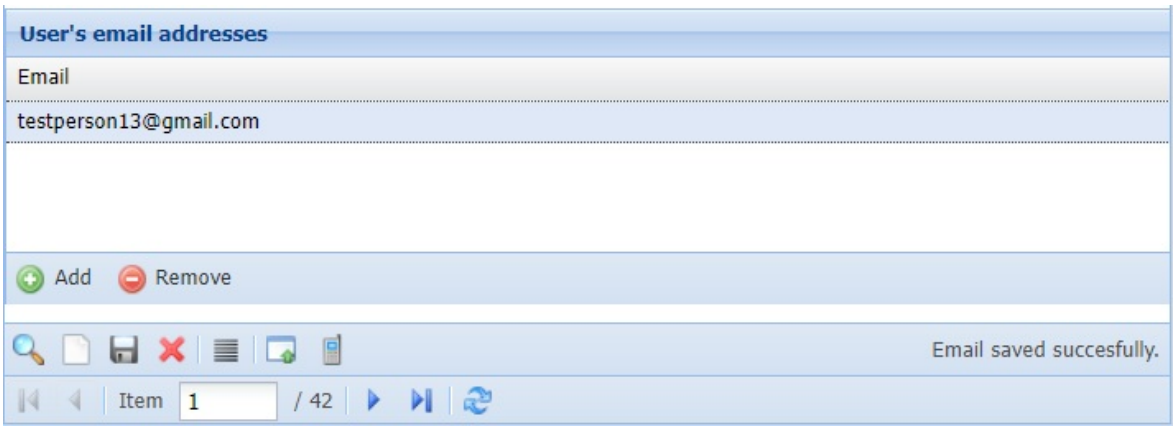
1. Press **Add user** button, which opens the **Consumer point users** form, where you can start adding user information such as **Name**, **Phone number**, **Category**, and **Restricted Type**. **Note!** The number in the

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Consumer point field appears automatically when a value has been given in the number field in the **Water** tab of the **Consumer point** form.



2. Notification: If the **By sms**, **Byemail** and **Byvoice message** check boxes are selected, messages about alert situations can be sent to the consumer point user by using the above-mentioned means. If **By voice message** is selected, complete the **Voice number** field.
3. Add the address info.
4. Remember to include email information by clicking **Add** button if it's permitted.



5. Save the changes by pressing **Save** button.

Importing user data (this function is subject to a separate order)

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As an additional service, it is possible to import external data in Excel format to the **Consumer point users** form.

NOTE! The import of user data is often synchronized with files of the external data service provider, which can be used to export contact information from, for example, residents of an apartment building to KeyAqua for customer communication. Ask more from Keypro's customer support or sales.

Choose **Import external users** button to select the file you want to import.



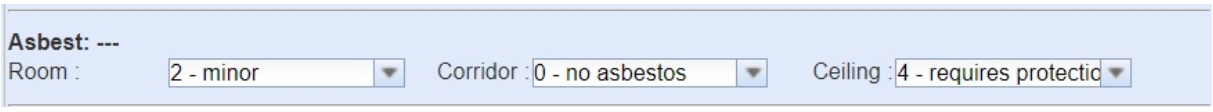
Note that old contacts are overwritten in the **Consumer point** form:

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	Name	First name	Last name	Address	Streetname	Streetno	Apartment letter	Apartment number	Zipcode	City	Municipality code	Municipality name	Mobile phone number	X coordinate	Y coordinate
2	Kalle Keypro	Kalle	Keypro	Teollisuuskatu 13	Teollisuuskatu	13			80100	Joensuu			0501122335		
3	Harri Hiuskuln	Harri	Hiuskulma	Teollisuuskatu 14	Teollisuuskatu	14			80100	Joensuu			0401122334		

Users are linked to consumer point based on address. You will receive an email with a message about the successful or failed import of external data. The email contains information about the number of added users and successful links.

Property attributes of the consumer point

You can add information related to the building and the connection to the **Consumer point** form. You can provide information on the presence of **asbestos** in a room, corridor, or ceiling.



- **To add several addresses to the consumer point, click Address** . On the Address form that will is displayed, retrieve the address and transfer it to the Consumer point form using the **Update to form** function.
- **To add areas to the consumer point**, click **Add area** . Select the area by retrieving it to the **Area** form that opens, and then click **Update to form** . You can connect a **consumer point** to various **areas**, such as metering areas. It is possible to measure the water volumes consumed in the area and compare the figures with the volume of water pumped into the area and create various types of water balance analyses on that basis.

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Note! The **Add area** function adds all active consumer points on the form to the areas.

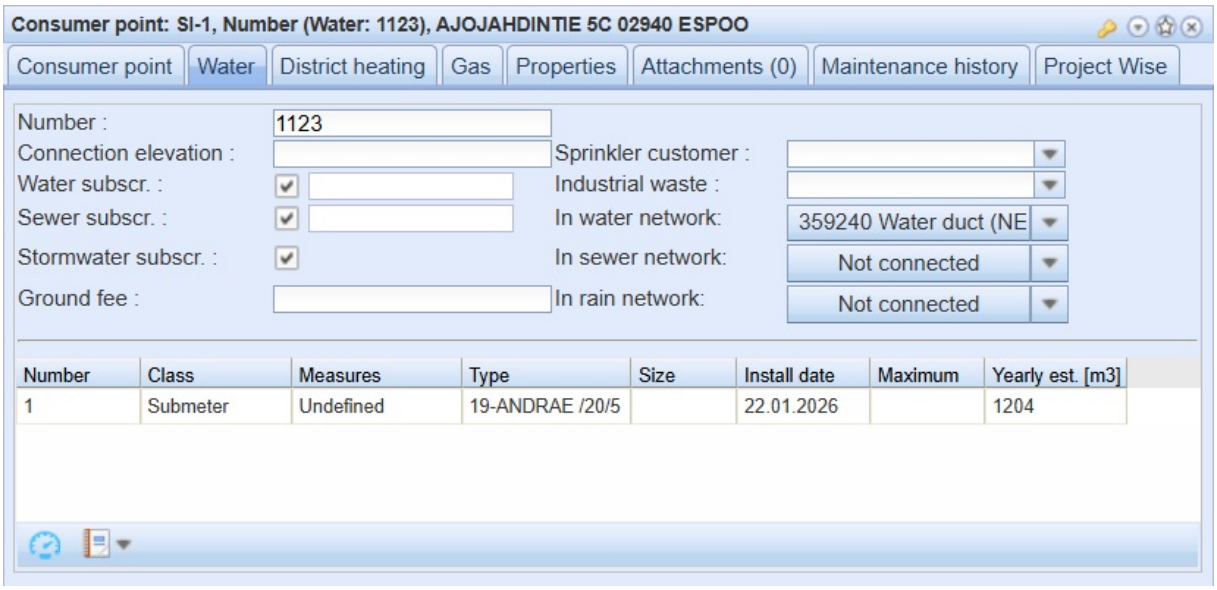
You can add free-form comments related to the consumer point in the **Notes** field.

To add the contact and user information for a consumer point to the SMS service, click **SMS Sending** . Further information on the SMS Sending service can be found in the chapter SMS Sending (a function subject to a separate order.

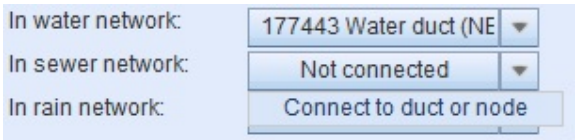
Water

If the consumer point is connected to a water, sewer, or rainwater network, its information will be processed on the **Water** tab. You must first retrieve a consumer point to the **Consumer point** form.

A **number**, **connection elevation**, and **ground fee** can be assigned to the water network, and you can define whether the consumer point in question is connected to the **water, sewer or rainwater network**.

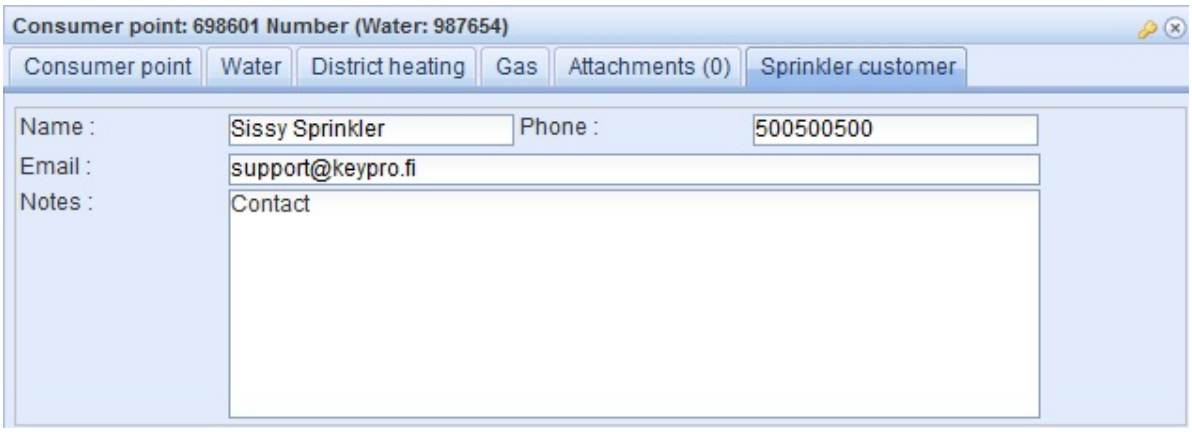


You can save information on the duct or node through which the consumer point is connected to the network. **Connections** can be made separately for **water, sewer, and rainwater networks**. To make a connection, select **Connect duct or node** in the drop-down menu for **In water/sewer/rain network**. Select the node or duct on the map. The selected object and its ID will be displayed in the **In water/sewer/rain network** fields. To open a node on its own form, select **Edit**. To disconnect, click **Disconnect**.



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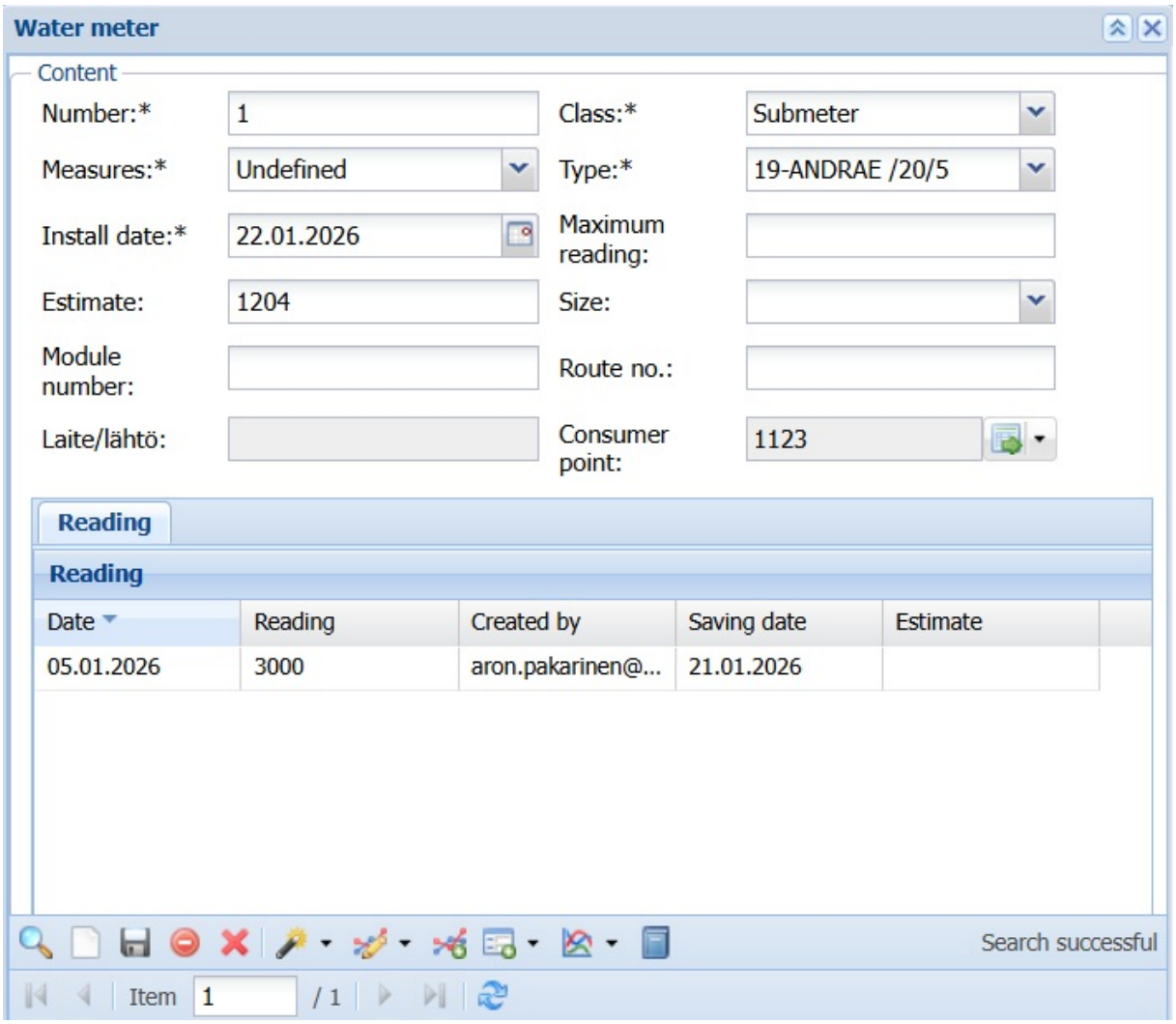
The consumer points for water networks can be marked to be **Sprinkler** or **Industrial waste** customers. To do this, select **Yes** in the applicable drop-down menu. When you define a consumer point to be a **Sprinkler** or **Industrial waste** customer, the software will create a new tab on the Consumer point form. Consumer points defined to be **Sprinkler** or **Industrial waste customers** have additional tabs for consumer-related contact information.



Edit meters

You can update information related to the meters with the **Water meter** form. You can open the form with the **Edit meters** button, which can be found in two different places. You can open the **Water meter** via the main toolbar. By clicking open the **Customer/Consumer point** menu, you will find the aforementioned **Edit meters** button, which will open the relevant form.

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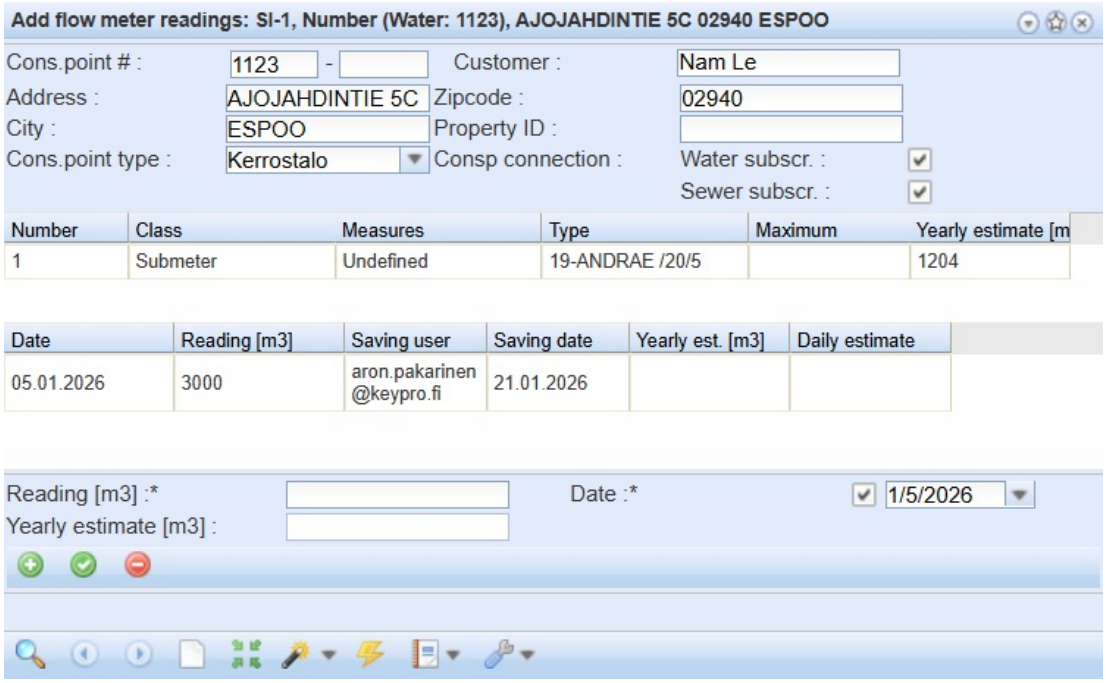


Adding meter readings to the system

1. You can add meter readings to the system by clicking **Flow meter readings to system** from the **Water meter** form's toolbar.

2. On the **Add flow meter readings** form, fill in the **Reading [m3]** and **Date** fields.

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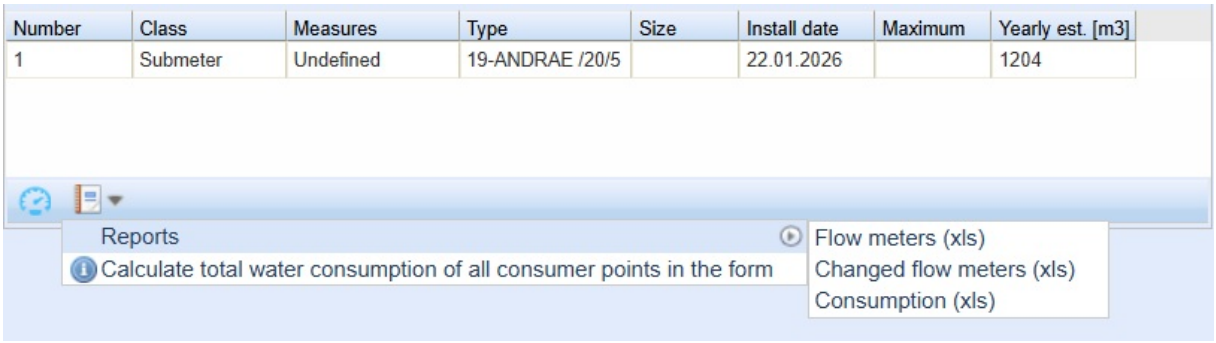


3. Click **Add flow meter reading** to add a new reading, update existing readings by changing the information on the fields and clicking the **Update flow meter** reading and remove existing readings by clicking **Remove flow meter reading** .

4. To update the **Water meter** form with the latest information, click **Save** from the toolbar.

Reports and total water consumption

To create reports, use the functions in the drop-down menu for **Export** : You can create Excel files on **Flow meters**, **Changed flow meters** and **Consumption**. In addition, you can calculate the **total amount of water consumption** for the consumer points on the form.

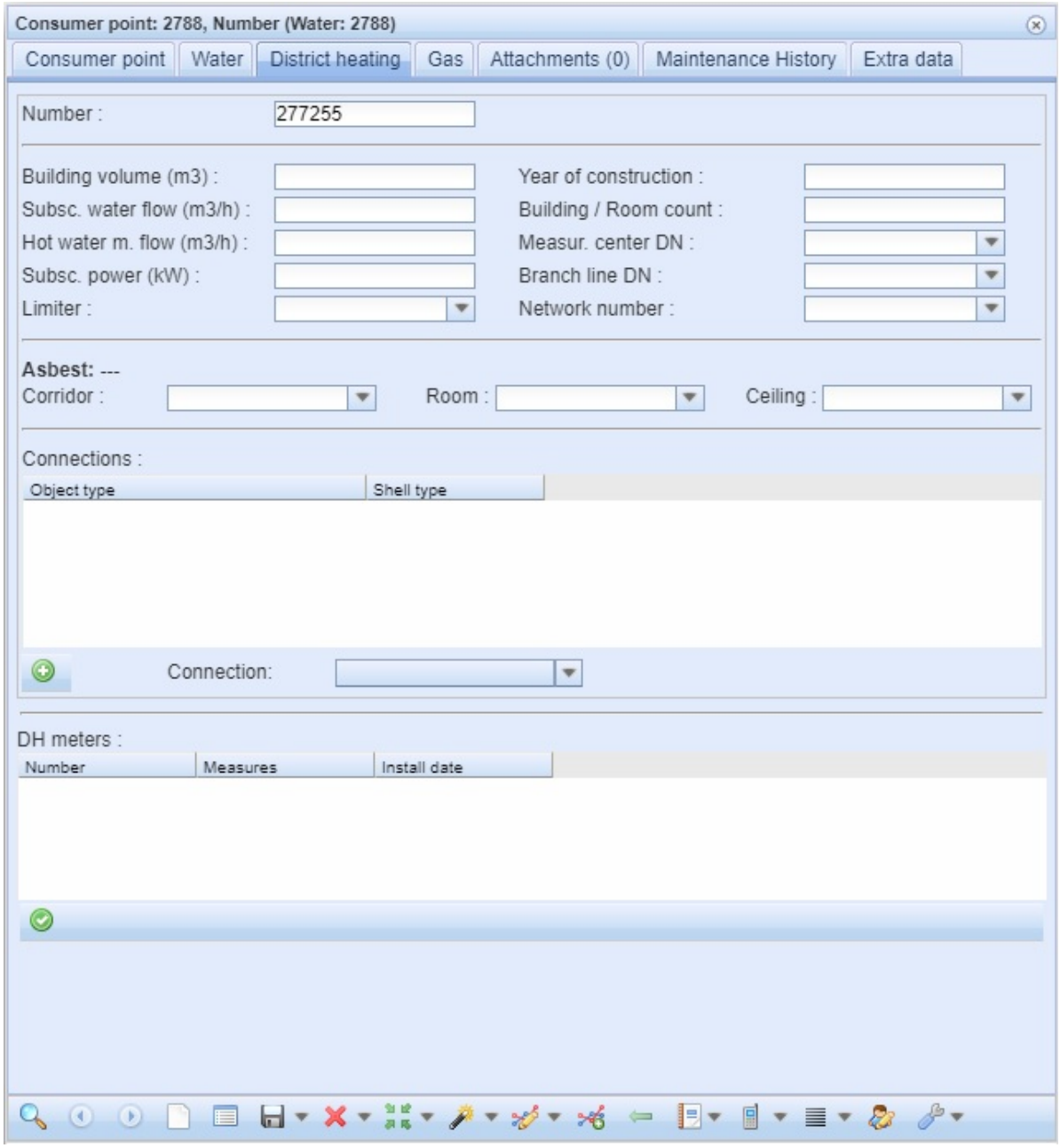


District heating tab

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You can connect a district heating duct or district heating node to a consumer point on the **District heating** tab. You can also edit the meters by selecting the **Edit meters** button. You will also gain access to the **Consumerpoint dhmeter** form.

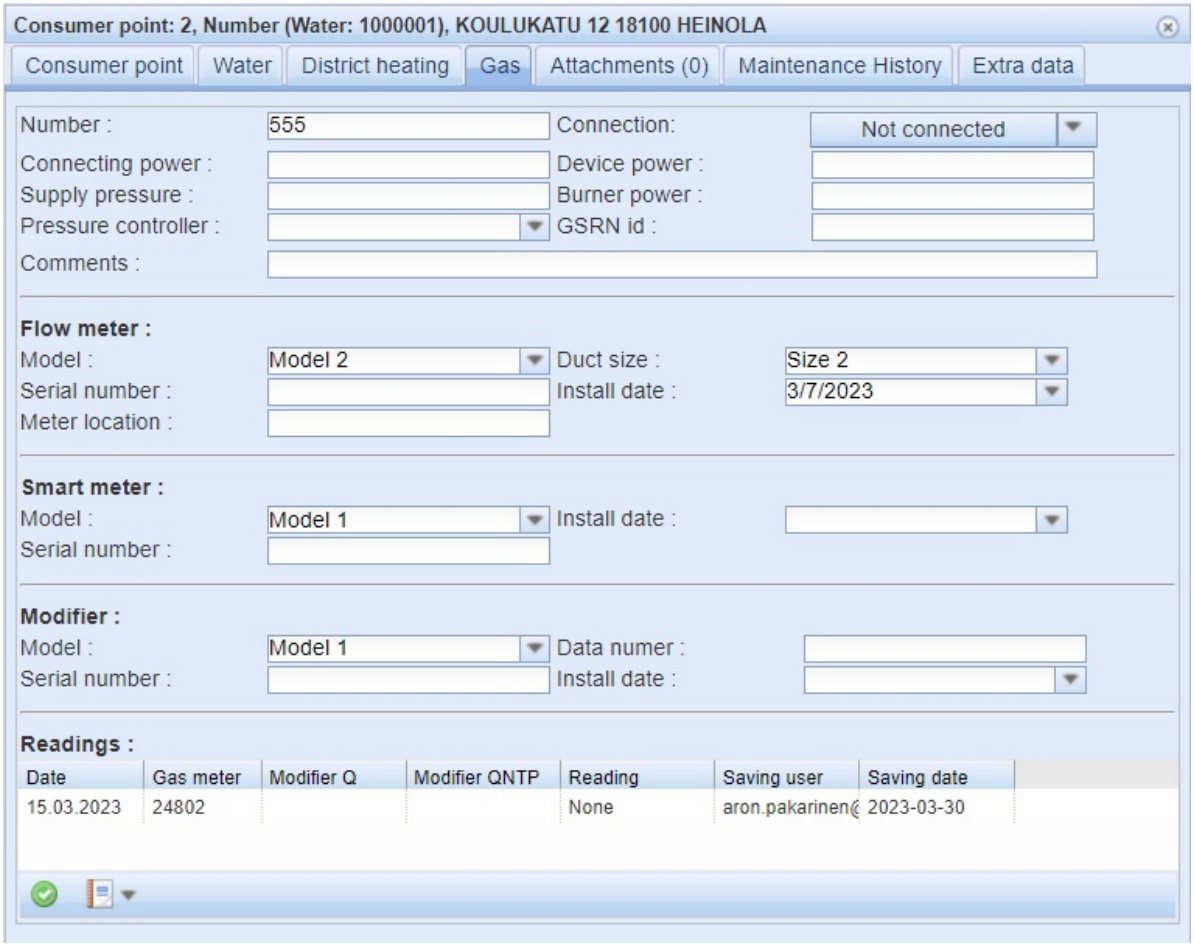
Add new connection button lets you choose a new connection on the map.



Gas tab

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You can record general information related to the consumer point and information related to meters on the **Gas** tab. Connection to a specific gas network node or duct is also possible. You can set information related to the **Smart meter** and **Modifier**. The meter readings can be seen at the bottom of the tab. Meter readings often come from an external system (for example, customer information or invoicing system).



You can use the following tools to manage subjects related to Consumer points and their users. These tools can be found from the **Customer/Consume point tools** menu from the main toolbar:

Customer/Consumer point tools	

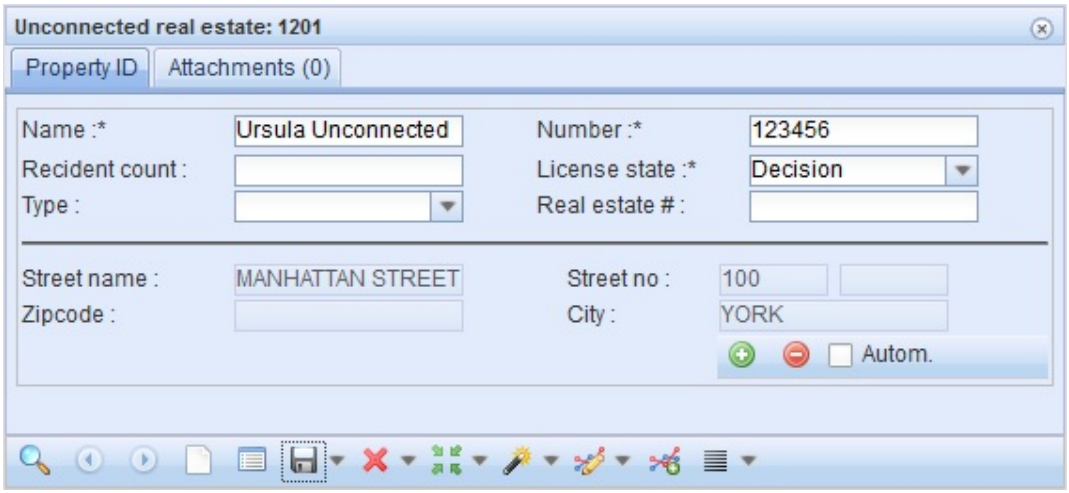
- **Adding meter readings to the system**
- **Edit meters**
- **Unconnected real estate**

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- **Join point statements**
- **Buildings**
- **Junction**

Unconnected real estate

Information on any real estate that is within the operating area of the service company, but that has not joined the company's network for some reason, can also be saved in the system.



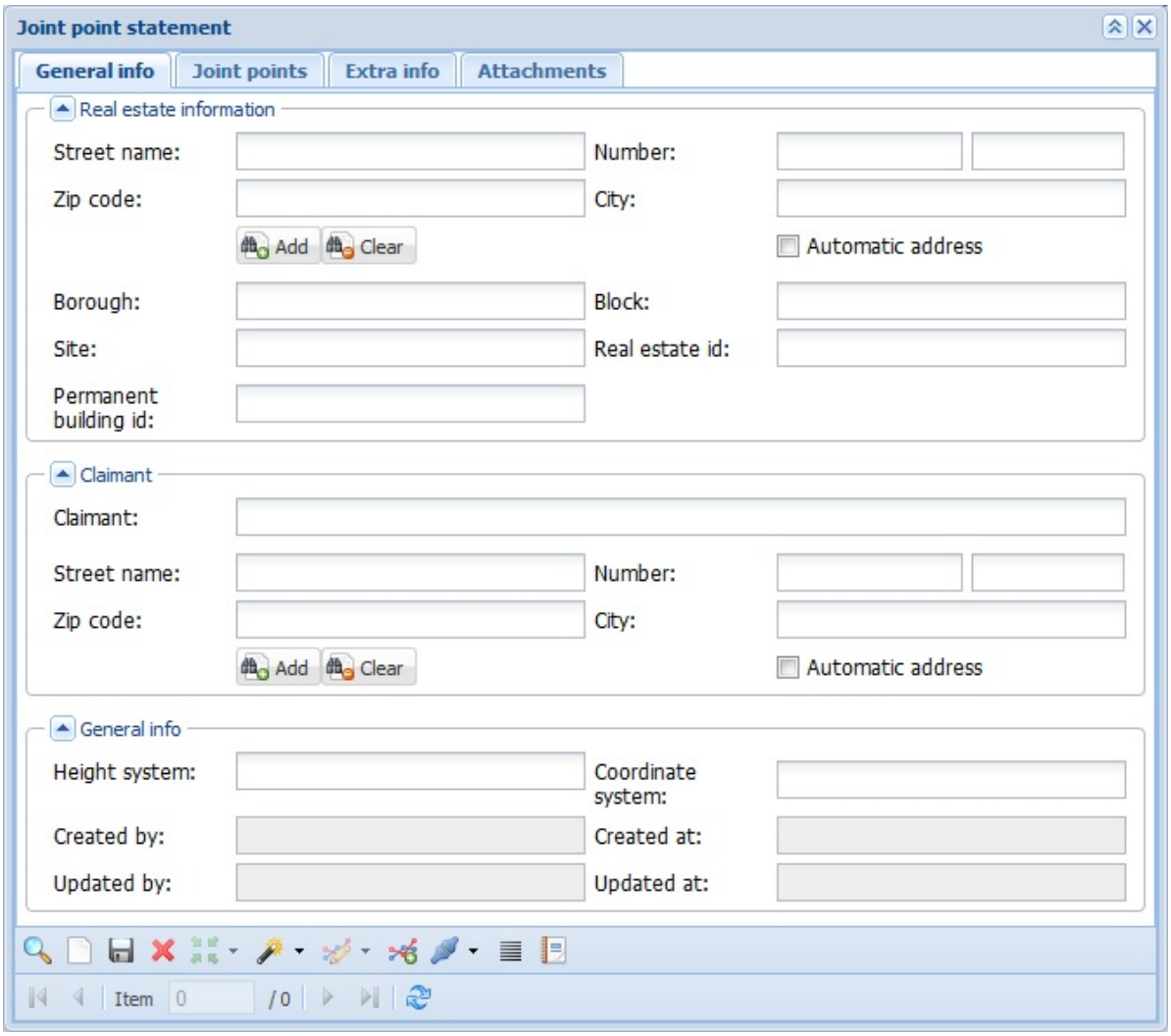
Joint point statements (this function is subject to a separate order)

With the **Joint point statement** tool, you can generate the information required for joint point statements and provide the customer with a map copy including, for example, joint points and the applicable elevation data. The **Joint point statement** form retrieves the basic data for the form on the basis of, for example, a parcel number or the address of a joint point location. A single joint point can have more than one joint point per network type.

To add a network object to a joint point statement, click **Connect target** . When you select an object on the map, the **Splitting** window opens. The **Lengths** and **Elevation** information is displayed in this window, and the values will change in accordance with your movements on the duct. To save the correct joint point on the form, select it with the left mouse button. The connected **Water, Sewer, and Rainwater network objects** are displayed on the **Joint points** tab.

You can add free-form text related to the **Joint point statement** on the **Extra info** tab.

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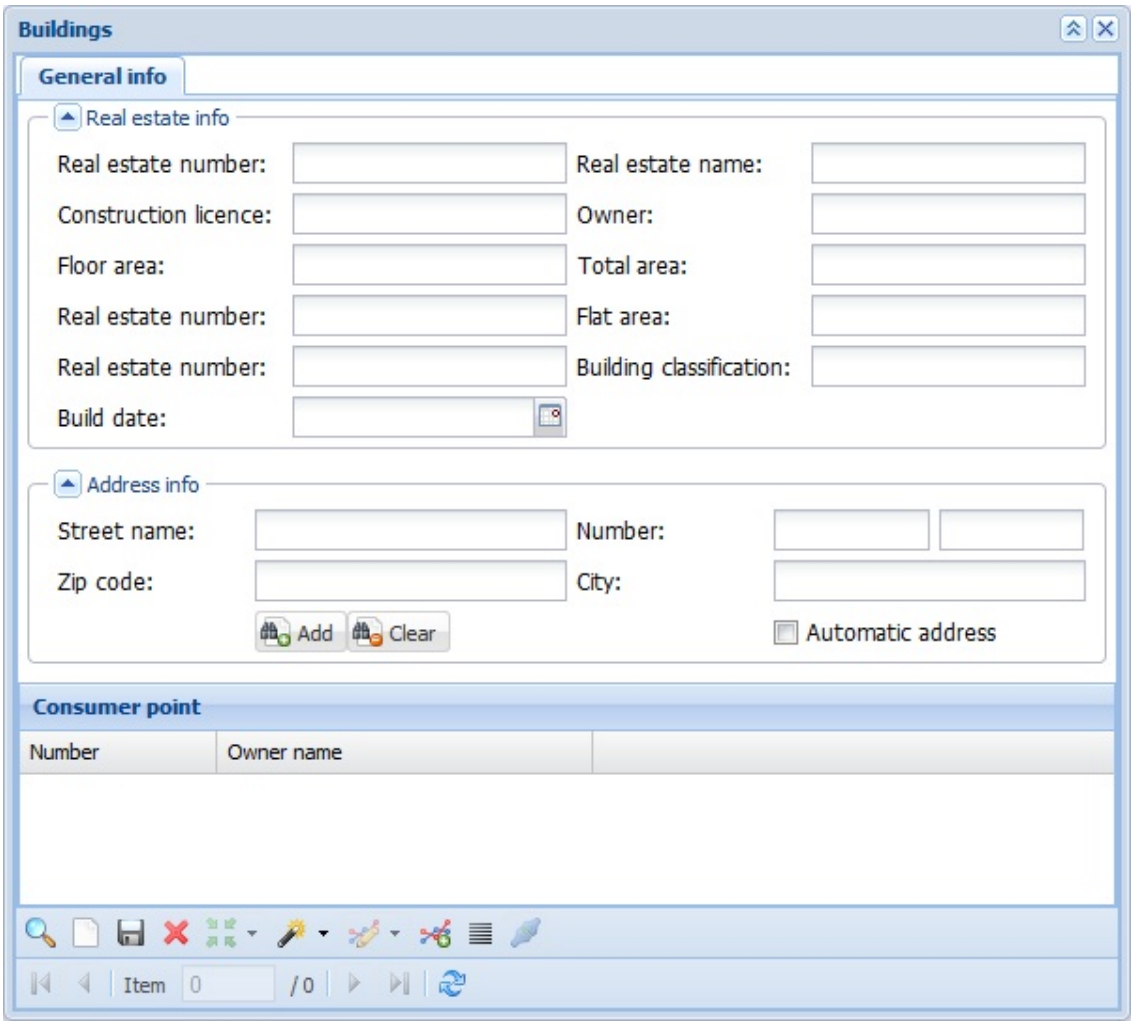


Buildings

The **Buildings** form is used for information related to buildings and their addresses. **Buildings** can be connected to a consumer point, in which case the **Consumer point** form will include a tab called **Building info**. To connect a building, click **Pick a consumer point** . **Note** that the **Consumer points layer** must be active in the **Layers** tool so that the consumer points are shown on the map and can be selected.

You can add the information on **buildings** to the system with the **Buildings** form, but usually this information is imported to **KeyAqua** from building information systems, in which case the data can be viewed on the **Buildings** form.

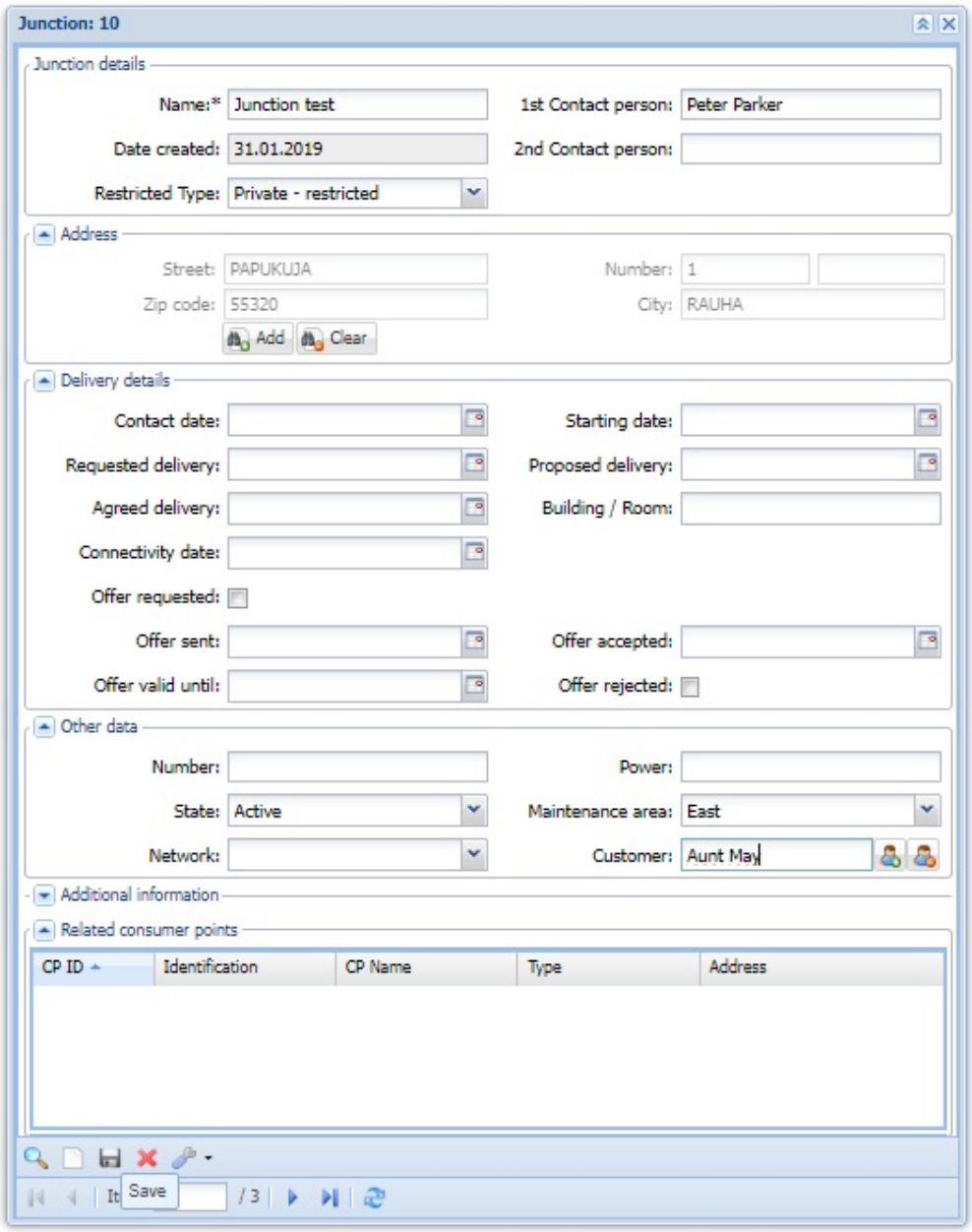
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Junction

You can save new network-related customer addresses on the **Junction** form.
You can save information on the form, e.g. about the offers and the time of delivery.

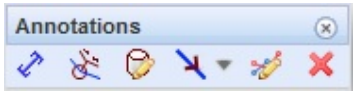
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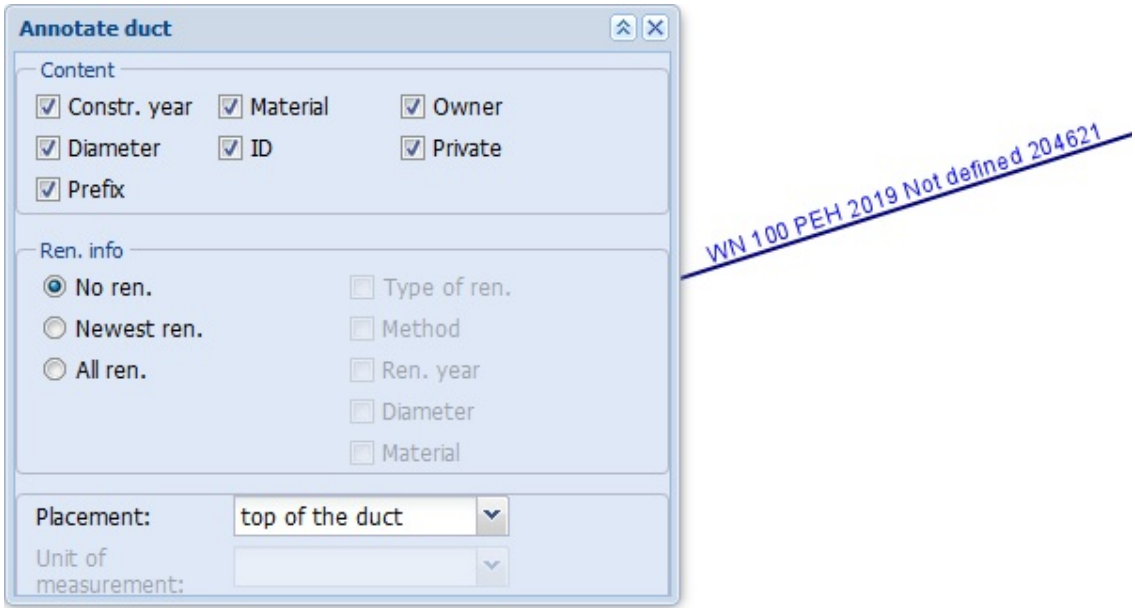
ANNOTATIONS

You can add information on map objects, such as ducts and nodes (material, diameter, construction year etc.), to the map view. The **Annotations** tool can be found in the toolbar at the top of the map view. You have real-time visibility to the information content of an annotation that is created on the map, and the content of the annotation changes if the annotation includes information that is updated on an object form. The various annotation tools are presented below.



Duct annotation

To start creating a duct annotation, click **Annotate duct** . Use the **Annotate duct** form to define the information content of the annotation and to select the presentation method. **To add an annotation to the map,** select a duct on the map for which you want to create an annotation and point at the location in which you want to place the annotation. You can define the information content of an annotation by selecting the required checkboxes.



Renovation information in an annotation

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To add all the renovation-related duct information to an annotation, select **All ren.** If you select **Newest ren.**, only the most recent renovation will be included in the annotation. The type of renovation, method, year of renovation, diameter, and material can be added to the annotation if you select **Newest ren.** or **All ren.**

Annotations are placed according to the duct geometry. To change the placement of an annotation, modify the settings for **Placement**. **The various placement methods are presented below:**

- **Above the duct** – The annotation is placed at the specified point and above the duct.
- **On the duct** – The annotation is placed at the specified point and on the duct.
- **Below the duct** – The annotation is placed at the specified point and below the duct.
- **In line with the duct** – After the duct has been selected, specify the point at which the annotation is to be placed in line with the duct geometry.
- **On annotation line** – The location of the annotation is displayed using an annotation line. After you have selected a duct, draw an annotation line to a location on the map that enables the annotation details to be read easily.
- **Height info** – Placing annotations with height info. First, select the object that you want to annotate on the map. After the selection, a window appears with the duct elevation information, which changes when you move your mouse pointer on the duct. Select the appropriate point on the duct with the left mouse button and then click on the map to define the placement of the annotation.

Node elevation annotation

With the **Node elevation annotation**  tool, you can add details to the geometry such as the elevation of a node's lid or ducts that are connected to the node.

When you click the **Node elevation annotation**  tool, the **Elevation Annotation** form open, in which you can select the information content and define the settings for presenting the annotation on the map. With the **Scale multiplier** value, you can specify the length of the annotation lines.

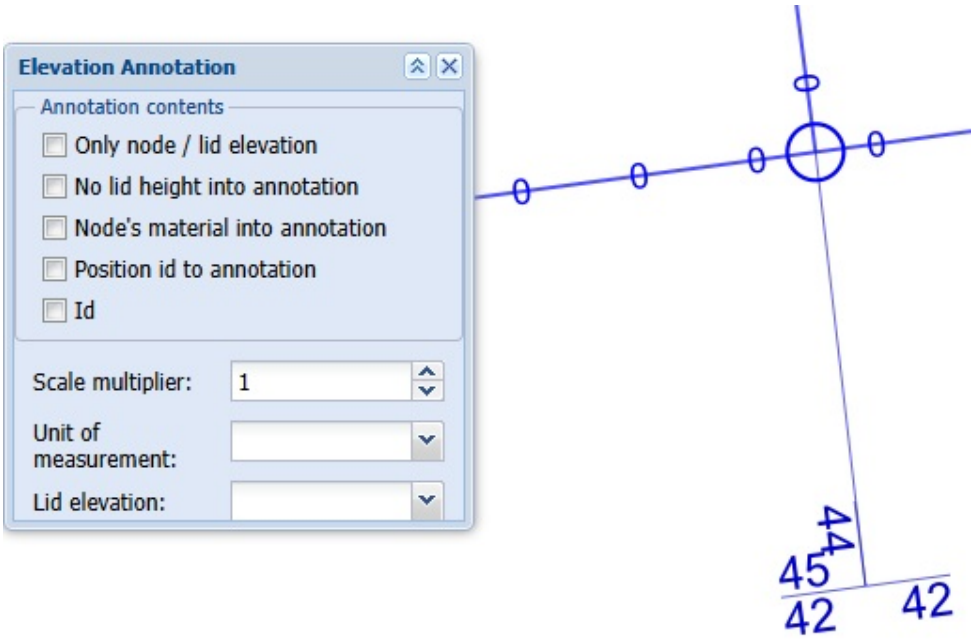
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To add an annotation, click the node with the left mouse button and then click the location in which you want to place the annotation. For example, in the case of a node, the annotation will be divided into as many sections as there are ducts that connect to the node. The annotation's direction indicates the duct that the annotation is related to. The duct elevation details will be displayed under the annotation, and the elevation of a node's lid above the annotation.

In the example figure below, the scale multiplier and elevation data for two ducts connected to a node are below and the elevation annotation for a node's lid is above the annotation.

The various elevation annotation contents are presented below:

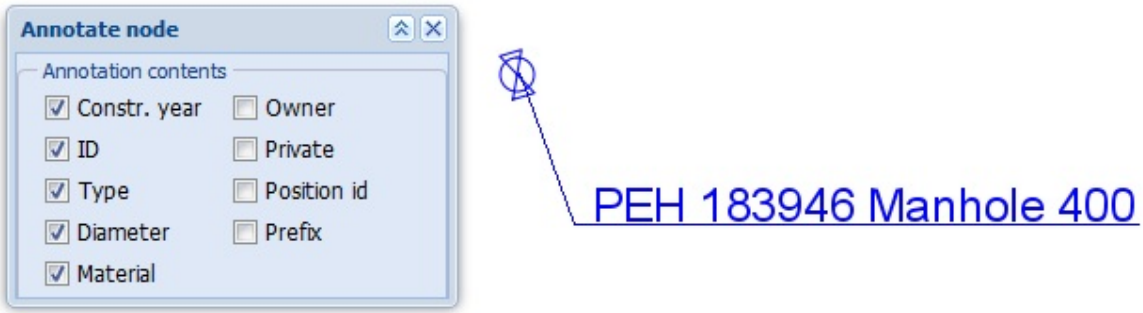
- **Only node / lid elevation**: Includes only the elevation of the node or its lid in the annotation.
- **No lid height into annotation**: Excludes the lid height from the annotation, even if it's available.
- **Node's material into annotation**: Adds information about the node's material (e.g., concrete, PVC) to the annotation.
- **Position ID to annotation**: Inserts the position identifier into the annotation.
- **ID**: Adds the node's internal identification to the annotation.



Annotate node

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Use the **Annotate node** tool to **add annotations for nodes**. Click **Annotate node** to open the **Annotate node** dialogue box. Select the information you want to include in the annotation. On the map, point at the object you want to annotate and place the annotation on the map.



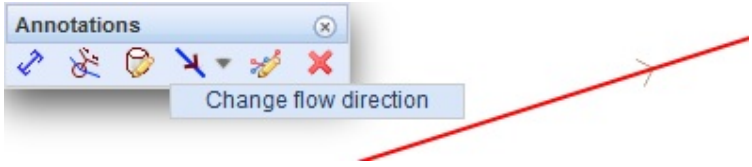
Symbols

Symbols provide more information on **KeyAqua** objects on the map. To activate the symbol placement, click **Symbols** . Select the symbol from the drop-down menu for **Symbols** and then point at the object and location on the map.



Flow direction

You can add a **flow direction** symbol for ducts. The flow direction is determined on the basis of the duct's elevation data (from the higher point to the lower) or the order of digitization (if no elevation data has been specified). You can change the flow direction with annotation tools. The flow direction symbol for the rainwater network will be created on the side of the duct where the mouse cursor is when the placement of the symbol is defined.



Non-specific location

If you want to emphasize that the object's location on the map is not precise, you can add the **Non-specific location** symbol ~.

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Edit annotation

To edit annotations, first click **Edit annotation** and then select the annotation on the map. Select the annotation by clicking the annotation line with the left mouse button or define the area by holding down the left mouse button.

Annotations consist of several parts, such as lines and text. When you define the annotation with the **Edit annotation** tool, a list of the defined annotation objects is displayed. The list lets you select items with the object in question highlighted on the map, making it easier to find the correct annotation. When the correct annotation has been selected, you can activate the editing tool by double-clicking the annotation or by clicking it with the right mouse button and selecting **Edit** from the menu. This will activate the editing mode for a line or point object and you will be able to **save the changes** with the right mouse button.

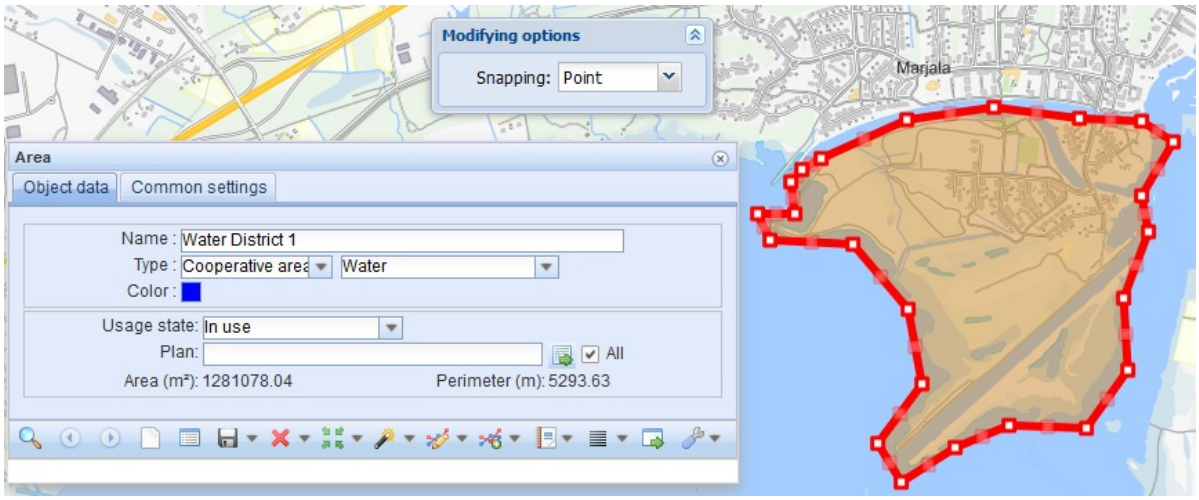
Deleting an annotation

To delete annotations, first click **Delete annotation** and then select the annotation on the map. Select the annotation by clicking the annotation line with the left mouse button or define the area by holding down the left mouse button. In addition, you can delete several annotations at once by defining the area. All annotations in this area will be deleted.

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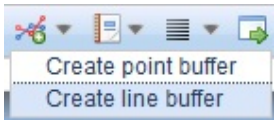
ADDING AN AREA

To add an area with the required shape on the map, go to the main toolbar at the top and click **Area** . You can add an area on the map, for example, for a print-out. You can define the **name**, **type**, **colour**, and **usage state** of an area, and you can attach it to a **plan**. To start the creation of an area, click **Create** . Then move your mouse pointer across the map and click the left mouse button at the appropriate location to create **line points**. Create the end point by first clicking the left mouse button and then the right mouse button. The area is automatically saved in the database.

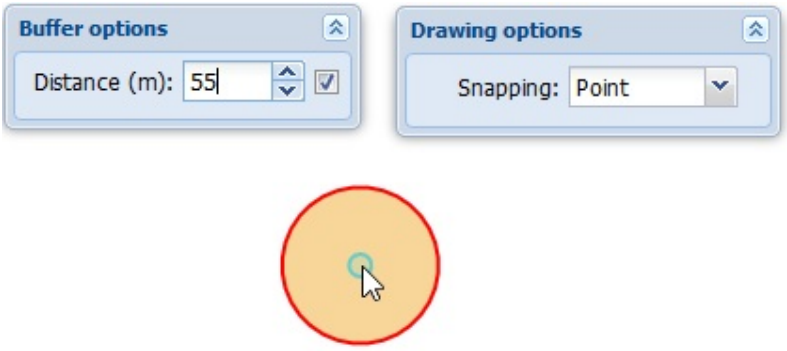


Adding a point buffer

In addition to other shapes, you can create circular-shaped areas. Start the creation by selecting **Create point buffer** in the drop-down menu for **Create**. Click the left mouse button on the map to point at the centre of the point buffer. To specify the radius, either click at the required distance from the centre of the area or select the **Distance** checkbox in the **Buffer options** dialogue box and define the radius in the field.

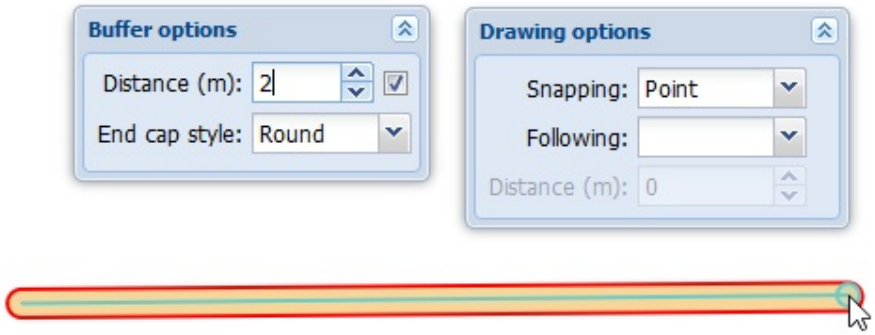


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Adding a line buffer

A line buffer creates a predefined area around a drawn line. Start the creation by selecting **Create line buffer** in the drop-down menu for Create. This opens the **Buffer options** dialogue box for defining the desired distance and end cap **style**. If you do not specify the distance by selecting the **Distance** checkbox, the width of the line buffer is determined when you finish drawing with the mouse. Once you have defined the settings, the buffer will be digitized on the map in the same way as other line objects. When digitizing a line buffer, you can snap to other objects and follow, for example, an existing water duct. The Drawing options are described in further detail in the chapter Snapping and following (settings for drawing and modifying).

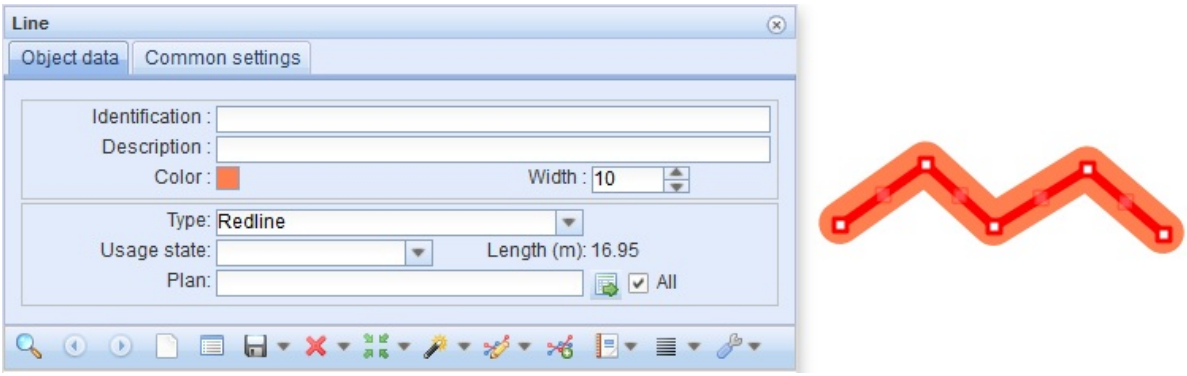


Adding a line

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You can freely add lines of various thickness and colour on the map, for example, for a print-out. To do this, use the **Line** function in the toolbar at the top of the map view to create and update various lines. The functions on the form that opens function in the manner described in GENERAL FUNCTIONS OF THE OBJECT FORMS. For example, search existing lines on the map by clearing the form and clicking **Search** . You can also locate and highlight lines. You can **modify the colour or thickness of the lines** you searched and picked from the map. Click **Save form** to apply the changes to the map. To have the free-form lines displayed on the map, the object layer in question must be activated in the **Layers** tool.

The line in the figure below is in edit mode and its points can be relocated.



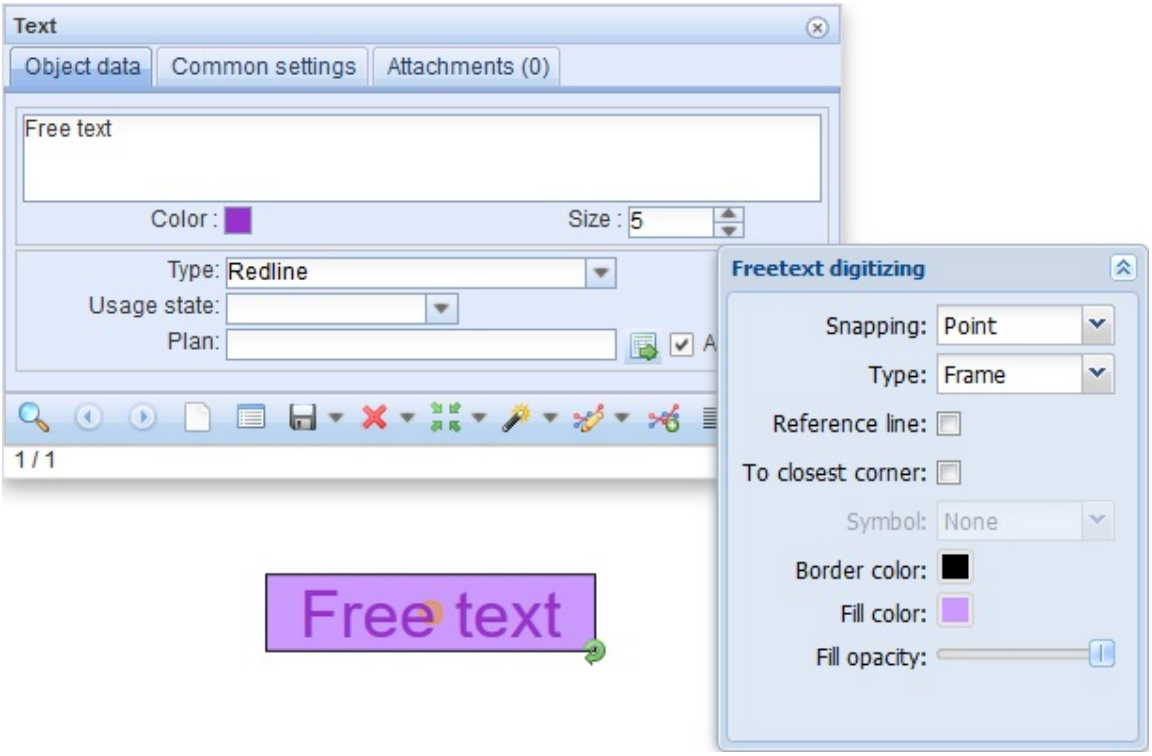
If you want to create a new line, select the **colour and thickness**. To start the creation of a line, click **Create** . Then move your mouse pointer across the map and click the left mouse button at the appropriate location to create the **starting point** of the line. To create the end point, first click the left mouse button and then the right one. The line is automatically saved in the database. When you click the Create button, the **Drawing options** dialogue box is displayed Snapping and following (settings for drawing and modifying.

You can reposition the line by clicking **Modify** . The line in question is then highlighted on the map. If you **click the line using the left mouse button**, the line can be modified. You can move the line's **points** by **dragging** them while holding down the left mouse button. Create more points by dragging the dimmed squares that are located between the actual line points. When you move these squares, you create more points. Click **Save** to save the changes. When you click the **Modify** button, the **Modifying options** dialogue box opens. The related functions are described in the chapter Snapping and following (settings for drawing and modifying).

Adding text

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To add free text to the map, open the appropriate form by clicking **Text** on the toolbar at the top of the map view. You can add text on the map, for example, for a print-out.



After selecting the **colour and text size** you want, you can type the text on the form. To define the actual location of the text, click **Create** . This opens the **Freetext digitizing** dialogue box for specifying the text formatting: **Type** generates either **plain text**, a **frame** for the text, or a **line** under the text. **Border color**, **Fill color** , and **Fill opacity** determine the appearance of the frame.

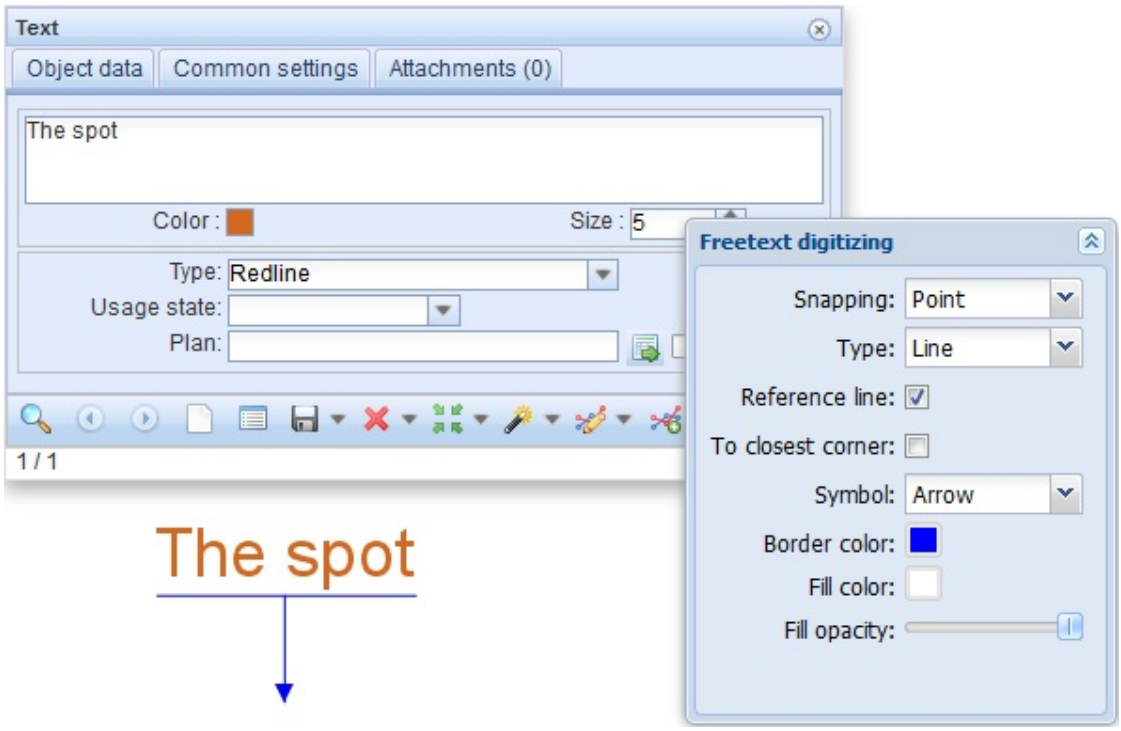
Other drawing options will affect text having reference lines (Adding text with a reference line on the map). When you have defined the modifying option settings, place the text on the map by clicking the **left mouse button** in the desired location. You can change the location by dragging the text placement point. To add text, click **Save form** .

To search for texts that have been placed on the map, click **Search** . You can edit searched texts or text you selected from the map in the text field and then save the changes by clicking **Save form**. You can delete or locate text retrieved to a form. To change the text location, click **Modify**. Move the point to the desired location using the left mouse button. Click **Save form** to save the change.

Adding text with a reference line on the map

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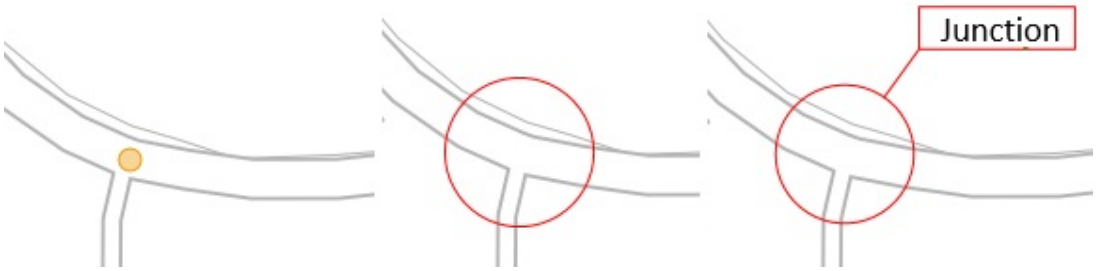
Adding text with a reference line is started in the same way as standard text. **In Drawing options**, select either **Frame** or **Line** as the text type. In the **Symbol** menu, you can select an **Arrow** to be used at the end of the reference line. When placing text, first select the reference line target with the left mouse button and then mark the location of the text. To snap to an object with a reference line, hold down the **Shift** key (see: Snapping and following).



Adding text with a circle reference line on the map

Text with a circle reference is added in the same way as text with a reference line. In the Drawing options, select **Circle**. When placing a reference, first click on the mid-point of the circle with the left mouse button and then define the radius by clicking on the map. Finally, click on the text location and save the text by clicking **Save form** .

In the example figure below, 1. Positioning the mid-point of the circle on the map. 2. Defining the size of the circle. 3. Positioning text on the map.

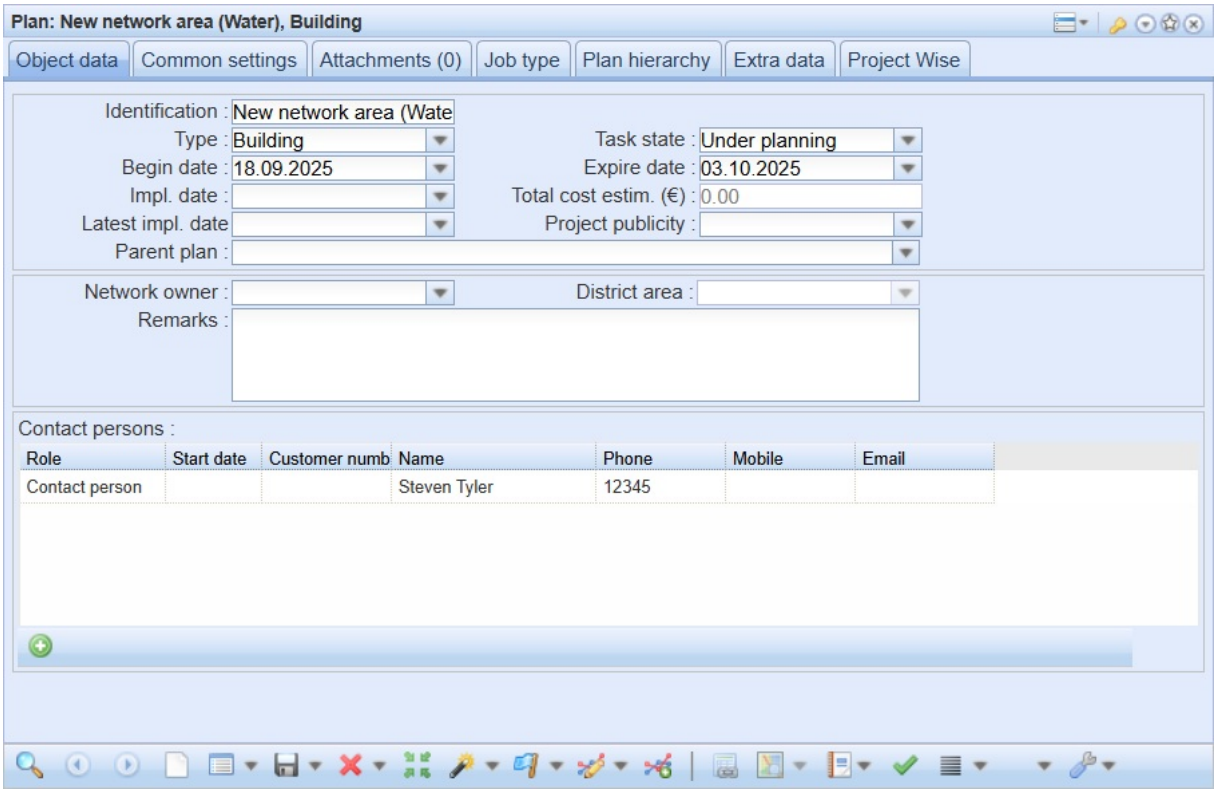


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PLANS

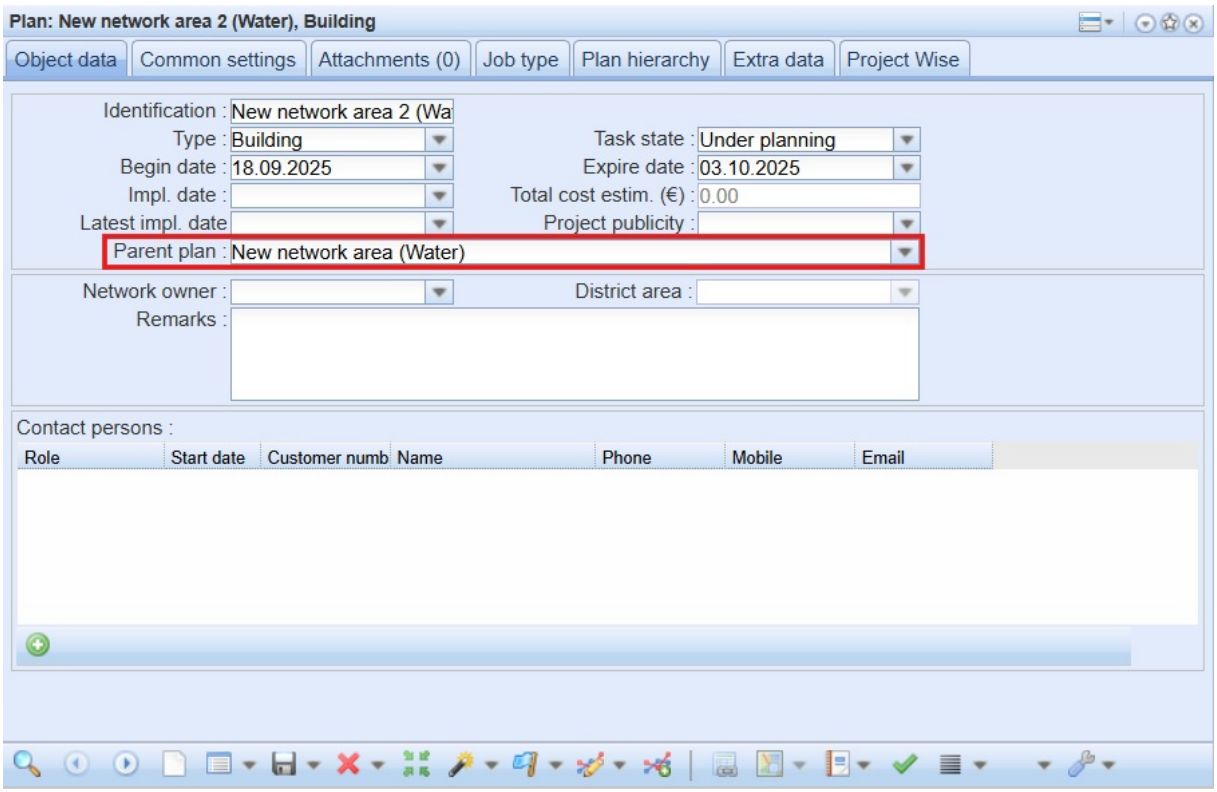
You can use the **Plan** field of an object form to attach the object to a **Plan** . If the required plan does not yet exist, you can create one on the **Plan** form. The **mandatory fields** for a new plan are **type**, **state**, and **identification**. Plans are selected to other forms based on their identification, so it is good to use a unique ID. After you have created the plan and saved it in the system by clicking **Save form** , it can be selected to object forms through the **Plan** menu of the forms.



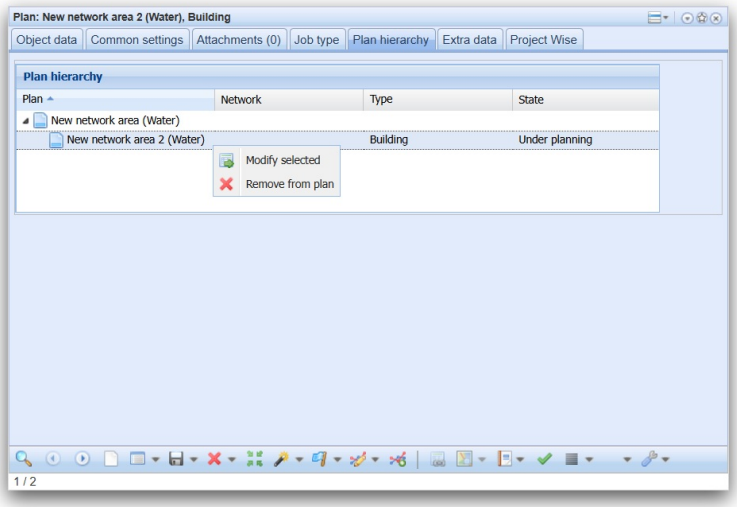
Plan hierarchy

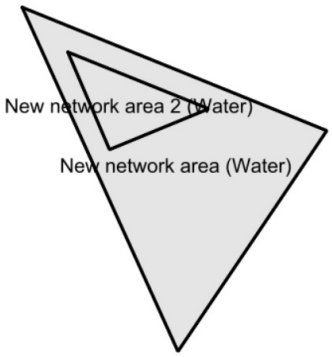
To add a plan as a sub-plan for another plan, simply select the desired parent plan from the **Parent plan** field located on the **Object data** tab. You can add multiple sub-plans under the same parent plan, or extend the hierarchy by adding a new plan under a sub-plan.

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Open the **Plan hierarchy** tab to view the parent plan and the sub-plans. To modify or remove a sub-plan, right-click its corresponding row in the table.





Set as the default plan

Click **Set as default plan** to set a plan retrieved to a form as the default plan. When you click **Defaults** on an object form, the default plan is automatically added to the form. To deactivate the **Default plan** setting, clear the **Plan** form and click the Set as default plan button again. A notification will be displayed: **Default plan cleared.**

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Highlighting a plan and listing objects

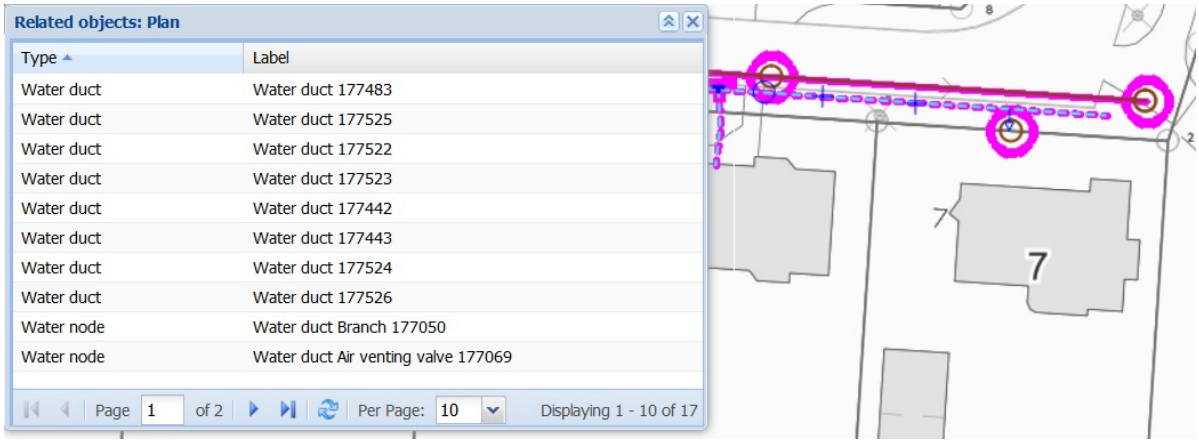
All KeyAqua objects can be linked to a plan. Object forms include a drop-down menu called **Plan**, which lists all plans with a state other than **Ready**. When the state of a plan is **Ready**, it means that the plan has been implemented and it will therefore no longer be added to objects.

You can create a new plan with the **state** in **Under planning.** You can then start digitizing ducts. New planned ducts must be added to the plan you created and the duct **state** must be either **Under planning** or **In preplanning**. After you have digitized all the objects in the plan and the installation of the objects is started in the field, you must change the **state** of the plan to **Under implementation**. When the plan has been completed, change the **state** of the plan to **Ready**. The state of all objects that have been added to the plan then changes to **In use**, which means that the objects are ready and in use.

Objects that are part of a plan can be highlighted on the map by clicking **Highlight** . This centers the map on the objects included in the plan and highlights the objects on the map.

Click **List objects of the plan** to view information on a plan's objects. This opens a window from which you can further open the forms for objects that are part of the plan.

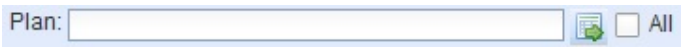
In the figure below, the listed plan objects are highlighted on the map.



Adding objects to a plan

You can add each network object to a plan. Object forms include a menu called **Plan**, which lists all plans with a state other than Ready. Plans with the state **Ready** are plans that have been implemented, and they can no longer be linked to objects.

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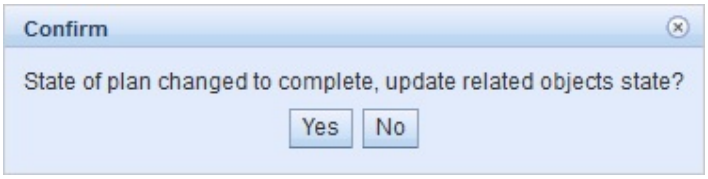


New planned objects must be added to the plan you created and the object's **State** must be either **Under planning** or **In preplanning**. After you have digitized all the objects in the plan and the field installation of the objects starts, you must change the state of the plan to **Under implementation**. When the plan has been completed, change the state of the plan to **Ready**. After this, the usage state of the objects added to the plan will change to **In use**.

Completing the plan

Plans include a feature that automatically updates the objects linked to the plan when the plan state is set to **Ready**. The objects will be updated according to the type of the plan.

The feature can be used in cases where a network has been planned on the map with subsequent implementation, and the usage state of the objects should be updated to **In use**. To update the usage states, upload the plan to the form and change the **state** to **Ready**. Click **Save form**. You will be asked to confirm your selection. Click **Yes** to update the state of the related objects to **In use**.



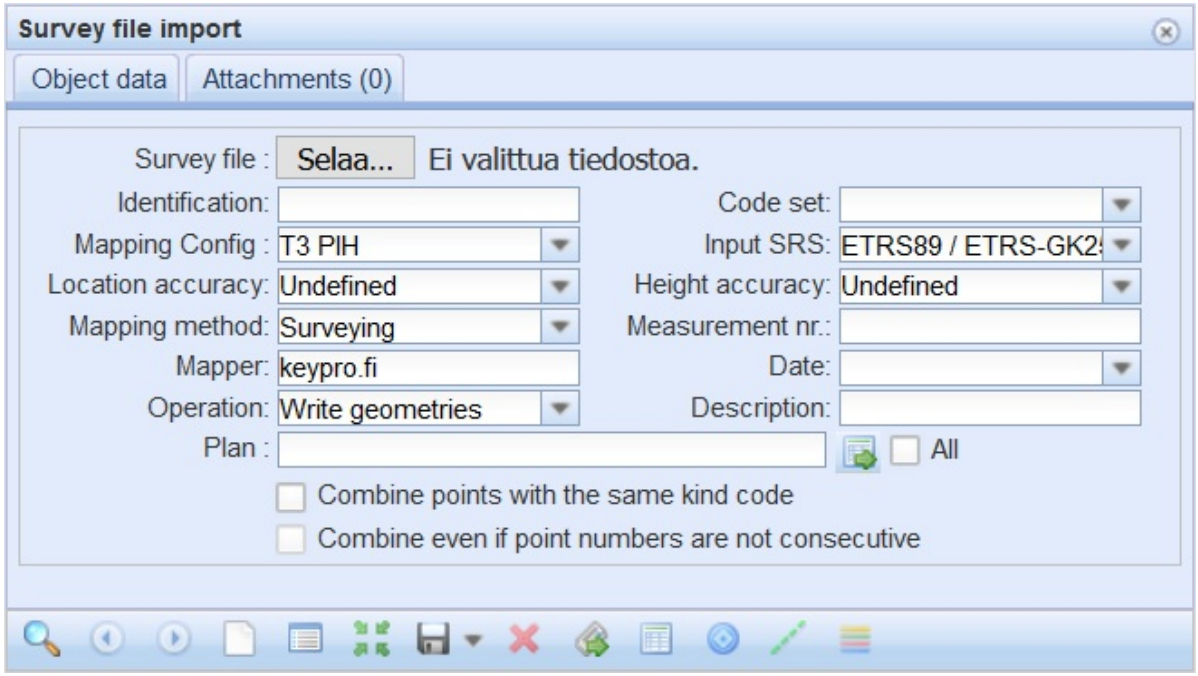
Show in group display

Click **Show current in group display** to open the plan's objects in a group display. More information on the group display is available in the chapter Group display.

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SURVEY FILE IMPORT

Use the **Survey file import** form to view the survey data in the system and to import survey files into the system. Surveys carried out in the field can be imported directly into the system.



Importing a survey file

1. In the main toolbar, click **Survey file import** .
2. Click **Choose file** to select the file for reading.
3. Select the right **Code set** used in the survey file.
4. Select the **Mapping configuration** that is appropriate for the survey file structure.
5. Select the correct **input SRS**for the survey file.
    a. KKJ (such as KKJ / Finland zone 1)
    b. Shortened GK (such as ETRS89 / ETRS-GK19FIN (EPSG:3126))
    c. Standard GK (2010) (such as ETRS89 / ETRS-GK19FIN 2010 (EPSG:3873))
    d. local coordinate systems (such as ANC Finland)
    e. WGS (such as WGS84 (EPSG:4326))
6. Select **Operation**:

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a. **Also create objects:** If you select **Also create objects**, the mapped ducts, manholes, valves, and so on, are created on the map.
b. **Write geometries**: The survey geometries include point and line objects, and the **Surveys** layer is activated in the **Layer selection** when these are applied.

7. Select the **Combine points with the same kind code** checkbox to form lines based on consecutive points.
8. Select the **Combine even if point numbers are not consecutive** checkbox to join lines with non-consecutive point numbers.
9. Fill in the rest of the fields as necessary.
10. Click **Convert** in the form's toolbar. The survey file is automatically saved after the conversion.

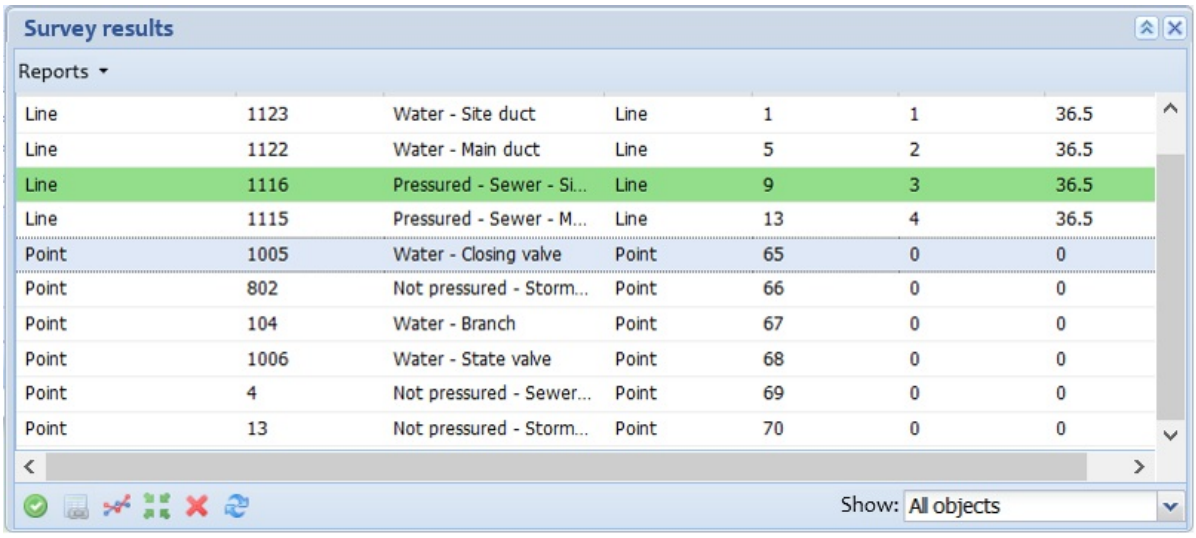
Any errors and warnings are displayed on the list. Usually, these errors are related to the structure of the survey file, and they are displayed to help find the possible errors in the file.

Survey results

Click **Show results** to view the survey objects in a list. In addition, the form will open automatically, for example, when you browse through the survey items, and the information on the form is updated in accordance with the survey that is being viewed.

The form shows what types of objects were documented in the imported survey. The list has seven columns by default: **Type, Kind code, Code description, Geometry, Point number, Line number, and Length**. The columns displayed depend on the survey setting that is applied. The objects for which **KeyAqua** network objects have already been created are displayed in the list with a green background.

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The imported survey file results can be located or deleted, or they can be used to create individual objects. Update the **Results of the Survey** list by clicking **Refresh** .

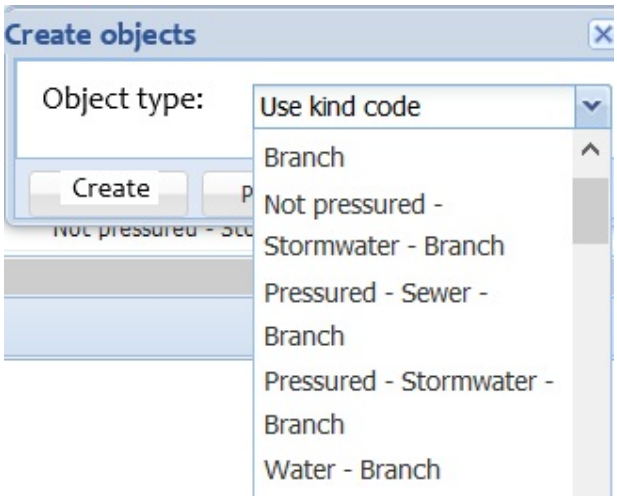
The **Show** menu includes the following options for displaying the Results of the Survey list: **All objects**, **Created objects**, and **Not created objects.**

Creating, locating, and deleting network objects

To create **KeyAqua** objects with the type defined in the **Type** column, select them on the list and click **Create objects** . The rows of created objects are marked in green.

If you want to create different types of items on a map from survey objects, first hold down the Shift key and click the left mouse button to select similar items from the list (Line or Point). Then click **Create objects** and select the correct **Object type** in the **Create objects** window that opens. For line objects, water and sewer duct options are available, and types such as manhole and valve are available for point objects. Click **Create** to display the survey items on the map.

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To locate a single survey geometry, select the correct object row and click **Locate** . To delete a single survey geometry, click **Delete object** when the geometry in question has been selected. The selected geometry will be displayed on the list in blue.

Editing network objects

1. Select the created object (green) that you want to edit.
2. In the toolbar at the bottom, select **Edit** , or click the right mouse button and select **Edit** in the menu.
3. The form for the created network object is displayed. For example, if the object's type is **Sewer duct**, the object is opened on the **Sewer duct** form.

Editing the geometry of survey objects

You can view survey objects on the **Survey Line string** and **Survey Point** forms that are available in the menu for **Survey file import** . The main purpose of these forms is to provide tools for editing the location and geometry of the objects. You cannot use forms to create new survey objects.

1. On the list, select the object whose geometry you want to edit.
2. In the context menu, click **Edit geometry** , or select **Edit geometry** in the toolbar at the bottom.
3. Depending on the geometry type of the object, the **Survey Point** or **Survey Line string** form is displayed.

Survey results report

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You can create an **Excel** report on the **survey results**, including the applicable codes, their number, and the total length per code. Create a report by clicking **Survey results report** in the menu for the **Reports** button.

Survey file description

Admin users can define various **Survey settings** for survey files.

T3 PIH format

The so-called GT format (T3 PIH) is discussed next. The GT file is a text file that consists of columns. Each row has 7 or 8 columns. These are called T1–T8. Columns are separated using space or tabulation characters. The data in a column must not include space or tabulation characters and, apart from column T8, the column cells cannot be empty.

In the figure below, an example of a land survey file. The survey file includes a sewer duct (1100), two different types of water ducts (1129 and 1134), and two water duct shut-off valves (8675), as shown in the code set used on the next page.

TIP: PIH = North, East and Height

```
9   1   1100    1   6942926.96 639232.12  50
9   1   1100    2   6942931.96 639242.12  52
9   1   1100    3   6942921.96 639252.12  54
9   1   1100    4   6942926.96 639262.12  58
9   2   1129    5   6942936.96 639232.12  50
9   2   1129    6   6942941.96 639242.12  52
9   2   1129    7   6942931.96 639252.12  54
9   2   1129    8   6942936.96 639262.12  58
9   3   1134    9   6942946.96 639232.12  50
9   3   1134    10  6942951.96 639242.12  52
9   3   1134    11  6942941.96 639252.12  54
9   3   1134    12  6942946.96 639262.12  58
9   0   8675    65  6943086.96 639232.12  50
9   0   8675    66  6943086.96 639242.12  50
```

T8 data model:

- T1 - Surface code
- T2 - Line code
- T3 - Survey code
- T4 - Point number
- T5 - North coordinate
- T6 - East coordinate
- T7 - Height (Z)
- T8 - Comments

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The file has information on one coordinate point on each row. The first four numbers are the point identifiers T1...T4, and T3 is typically the survey code. **Survey code** refers to a "key" that is used to link the description and property values to a certain coordinate point. The applied code set defines the kind codes that are used in a land survey file. These can be edited via the admin user interface.

- The **line code T2** is used to separate line object lines. For point objects, T2 is 0.
- The **identifier T4** is usually the **point number** defining the order in which points have been measured.
- Identifiers are followed by coordinate values. Coordinates can be in the order **North-East-Height** or **East-North-Height** (this can be defined on the form).
- In addition to the **coordinate values (T5–T7)**, a row can include a **comment** or other information related to the object **(T8).**

The following code set is applied to the example:

Point	100	Sewer branch
Point	8675	Water closing valve
Point	1001	Pressured sewer valve
Point	106	Water branch
Line	1100	Sewer duct
Line	1103	Sewer private duct
Line	1106	Pressurised sewer duct
Line	1120	Rainwater duct
Line	1129	Water duct

T11 PIH format

The GT file is a text file that consists of the same eight columns as the T8 format and has additional three columns which are **Depth**, **Location accuracy** and **Height accuracy**. Each row has total of 11 columns. Columns are separated using space or tabulation characters. The data in a column must not include space or tabulation characters and, apart from column T11, the column cells cannot be empty.

To be able to use this format, select **Keyaqua default code 2022** from the **Code set** menu.

T11 data model:

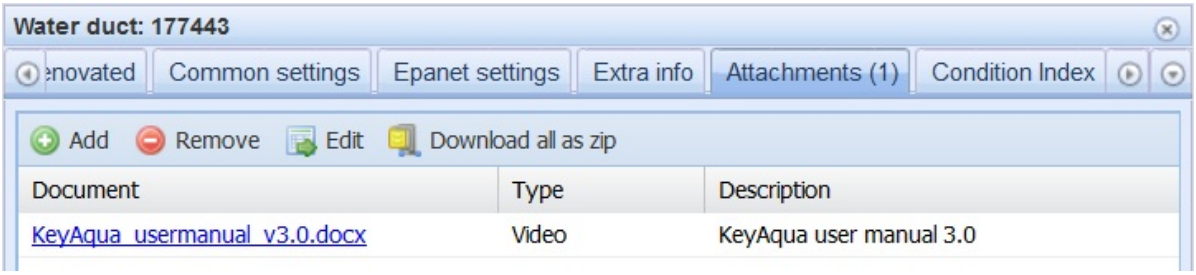
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- T1 - Surface code
- T2 - Line code
- T3 - Survey code
- T4 - Point number
- T5 - North coordinate
- T6 - East coordinate
- T7 - Height (Z)
- T8 - Depth (from the ground level or from the open trench)
- T9 - Location accuracy
- T10 - Height accuracy
- T11 - Comments

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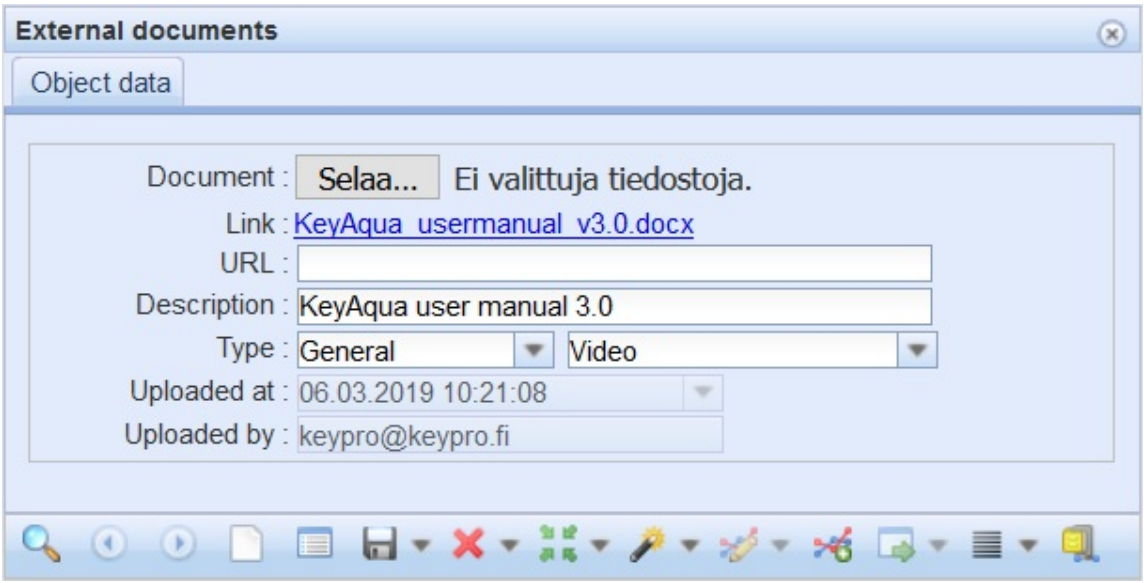
EXTERNAL DOCUMENTS

External documents can be **files** or **URL links** that can be positioned on the map and attached to **KeyAqua** objects. External documents can be added and viewed on the **Attachments** tab of the forms.



Adding an external document

To add a new attachment, click **Add** on the form. This opens the **External documents** window.



1. If you want to add a file, click **Choose files**.
2. Select the file or files that you want to attach as external documents.
3. Save the information on the form (**Type** is a mandatory field).
4. Click **Save** , or if you are attaching documents to an object, click **Attach document** .

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If you selected several files, a separate external document is created for each file.

TIP: If you want to attach a **web address**, enter it in the URL text field or copy the address from the browser. If you also select a file, the URL is additional information to the document.

To open an attached document, **click it** with the left mouse button. This opens a window in which you can choose whether to open the file or save it. If you want to save the file, a new window will open for you to specify the location for saving the file and the name of the file. The URL link will open on a new tab in your browser.

To download all attached files to your device, select **Download as zip** .

Viewing external documents

To select a document **for editing**, select it from the list with the left mouse button and then click **Edit selected** . Information on the attachment will be displayed in the **External documents** window. Alternatively, you can open the window by clicking **External documents** on the toolbar. Click **Save form** to save changes.

Deleting an external document

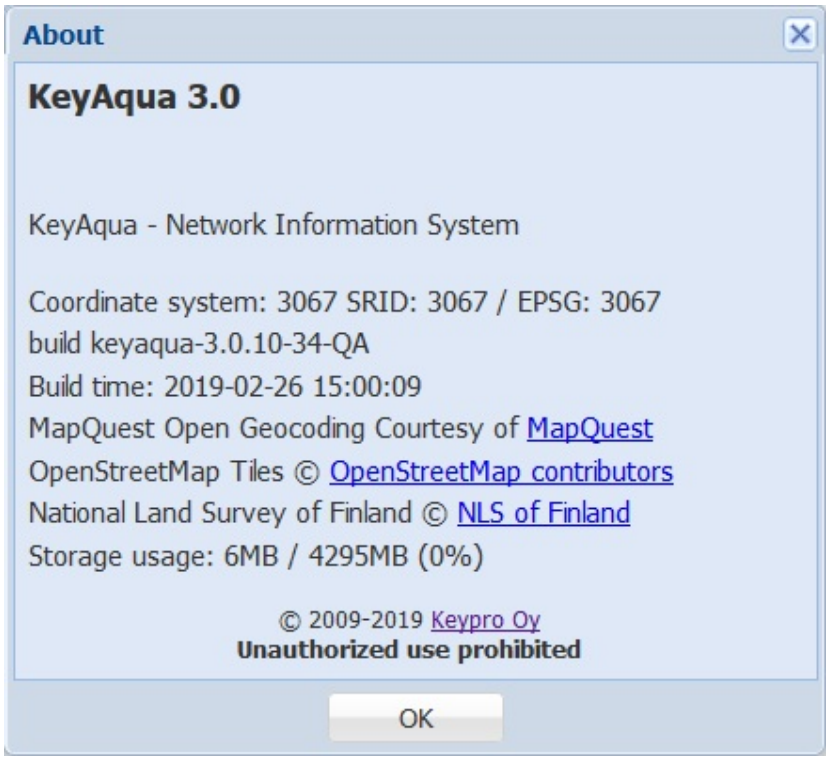
Click **Delete** to delete an attachment**.** If the document has been attached to an object, you will be asked to confirm the deletion.

Document size

The maximum allowed size of a single document is 100 MB. The storage space reserved for documents is limited – in principle, 4 GB of storage space has been reserved. You will be notified if this limit is exceeded when a file is being uploaded to the system. In this case, you must either delete old files to free up space or order additional storage space.

To check the disk space used by the files, click **About** in the drop-down menu for **Help** in the upper-right corner.

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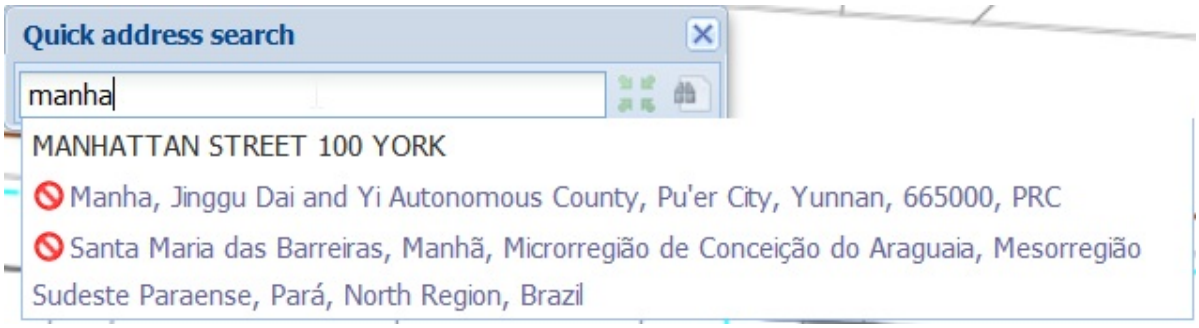


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ADDRESS

Address search

Use the **Quick address search** tool in the toolbar to **locate addresses on the map**. For example, if you want to view a network located on a specific street, you can go to the location in question by using the quick address search and then locating the address by clicking the **Locate** button. Start typing the street/road address in the **Quick address search** field to have the options listed below the field and then select the one you want. Click **Address** to open the form used for editing the address.



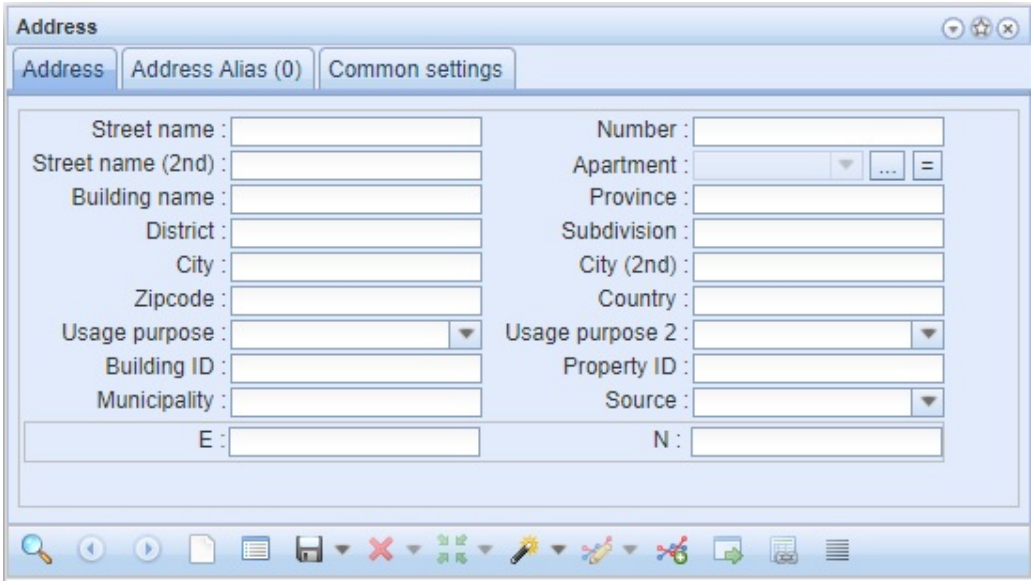
Note that the **Quick address search** tool does not list addresses that have no location attached. Such addresses can be searched on the actual address form (**Address**).

Address search in the database

The **Address** tool can be used to search addresses in the database and to locate them on the map. This tool can be used to update address information and add new addresses to the database. When you click the button, the **Address** form is displayed. On this form, enter the address you want to find and click **Search** to have the program search the database for addresses matching the **search criteria**.

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For example, a search based on a city will return all the addresses in that city as search results. You can use **%** as a **wild card** character that replaces a part of a search term. In this case, the search results include all addresses matching the text that precedes the **%** character. The number of results that meet the search criteria is displayed in the bottom left corner of the form. Use the **arrow buttons** to browse through the search results . You can center the map on the searched address with the **Locate** function on the form.



If the **Address** form has been opened from some other object form using the **Address search** function, the **Update to form** button will be activated on the **Address** form. Click the button to update the address selected on the form to the object form. This enables you, for example, to add an address to an error report.

Adding an address to the database

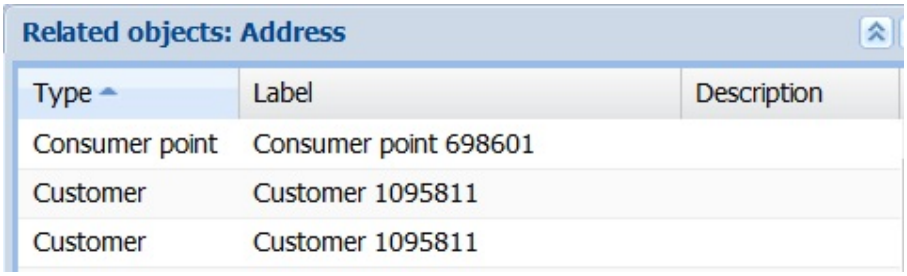
If an address is not yet in the database, and you want to add it there, use the **Address** form to create an address. **Street and City are mandatory property attributes**. When you have saved this information, click **Create** , and then click the left mouse button to place the address on the map.

When updating address information, please note that the changes will affect all network objects and events using the same address. Addresses that are used by network objects or events cannot be deleted from the system.

Objects related to an address

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Click **List related objects** to view the **Related objects: Address** dialogue box listing objects **located at the address** in question. The list includes the following information on the objects: type, label, and description.



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SMS SENDING AND ALERTS (these functions are subject to a separate order)

KeyAqua's SMS Sending service is used to send notifications (e.g. leakage or maintenance situations) to the customers of a water supply plant that can be found in **KeyAqua**. You can send a notification to a maximum of 500 recipients at a time.

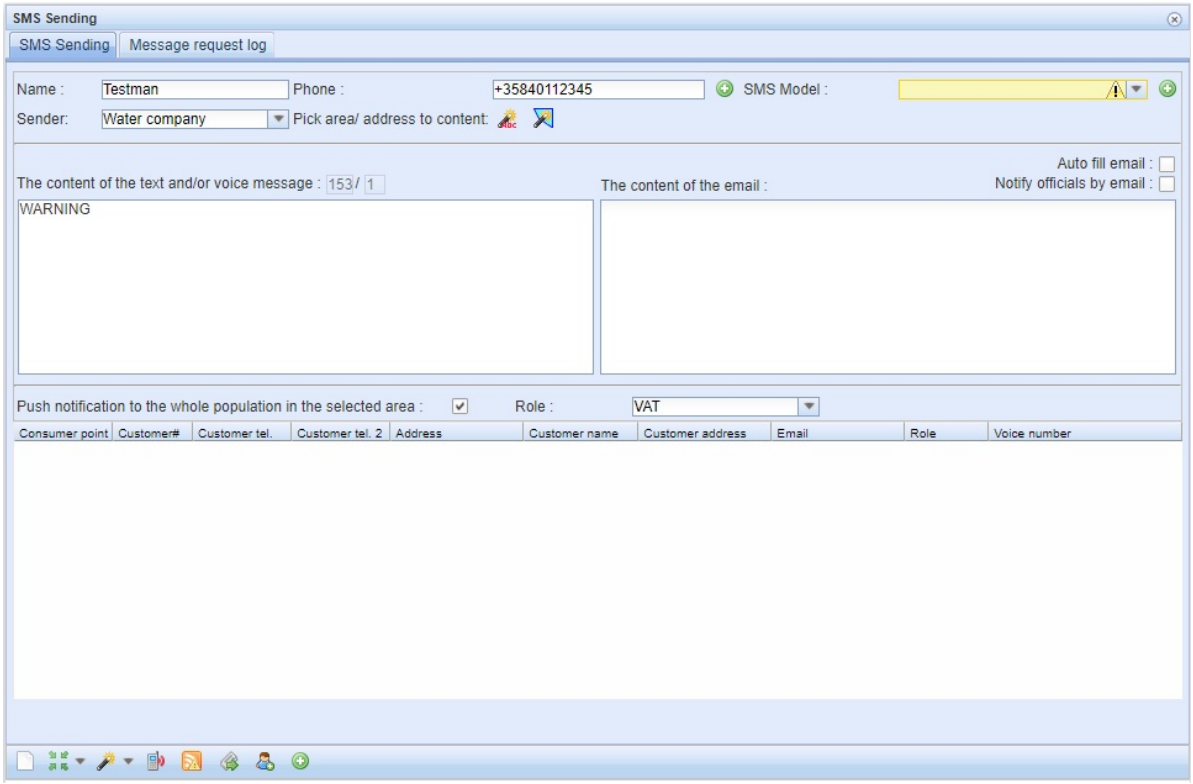
The SMS Sending form

The SMS Sending service is available in the main toolbar in the drop-down menu for **Customer/Consumer Point**:



The form consists of two tabs: **SMS Sending** and **Message request log**. SMS messages are sent through the first tab. Add customers/phone numbers to the form for sending the text message. Enter your message in the **SMS** field and click **Send SMS**. Information on sent messages is stored on the **Message request log** tab.

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Adding customers to the form

The following paragraphs describe the various ways to collect the target phone numbers to the **SMS Sending** form. There are various ways to create a target group: Each group of new phone numbers is added to the existing phone numbers on the form. If a phone number is already included in the list for SMS sending, only one SMS will be sent to it.

Adding individual customers

You can add a customer/phone number to the target group by using the top section of the **SMS Sending** tab

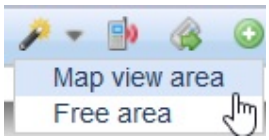


To add a customer, complete the **Name** and **Phone** fields and click the **Add new customer** button next to these fields. Phone number information is mandatory. Adding a name will help you distinguish one phone number from another on the target list, but it is not necessary.

Picking customers from the map

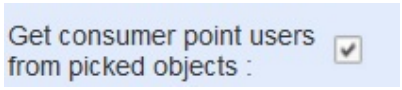
To pick objects to the form directly from the map, use the **Pick** tool and the options in the related drop-down menu.

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The tool is used in the same manner as the **Pick** tools on other forms. Use the tool to select **Consumer points** and the customers connected to them from the map. A **customer** may be connected to a consumer point as either an owner or an invoice recipient.

When the **Get consumer point users from picked objects** checkbox is selected, it means that the **Pick** tool retrieves to the list the users of the consumer point in question. A **user** can be, for example, a person living in an apartment of the apartment building that is the consumer point.

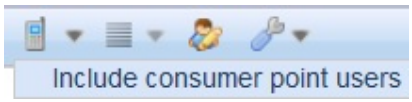


Importing from the Customer/Consumer point/Consumer point user form

Customers can be imported to the SMS Sending form from the Customer and/or Consumer point forms**.** You can retrieve **Customers** to these forms by using the available tools for searching and picking. When you have added the target group to the form, you can transfer it to the **SMS Sending** form by clicking the **SMS Sending** button on the form.



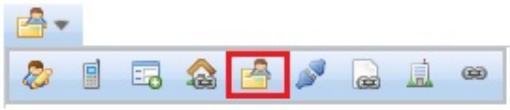
On the **Consumer point** form, this tool also provides the option **Include consumer point users** in the drop-down menu. This functions in the same way as the **Get consumer point users...** selection described in the previous section. In other words, it will add the consumer point users to the SMS Sending form.



Using Consumer point user form to send SMS

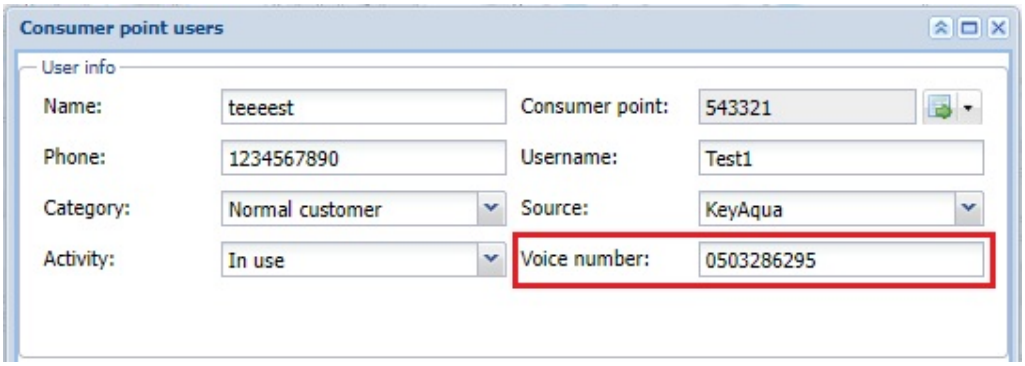
Consumer point users are not the owners/administrators of the **Consumer point**. They are, for example, tenants or other family members. **Consumer point user** form can be found from the **Customer/Consumer point** menu from the main toolbar.

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Consumer point users form has many fields which affect the way the SMS is received.

1. **Voice number**: The number on the field is for receiving voice messages:



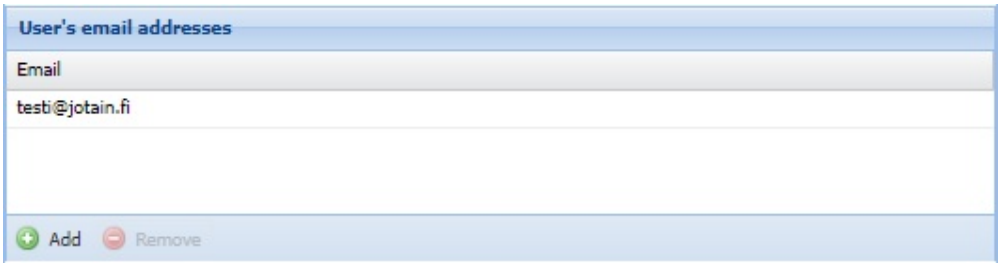
1. **Notifications**

There are three option to notify the consumer point user, by **SMS**, **email** or **voice number**. You may also choose all of them if necassary:



2. **User's email addresses**

It is possible to send a message written in the **SMS** form to the saved email address:



3. **Send SMS**

When all the information has been filled in, open the **SMS sending** form by pressing **Send SMS** . The information of the **Consumer point user** will be transferred to the recipient list of the message:

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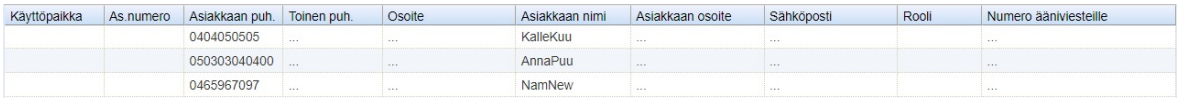


Saving default recipients

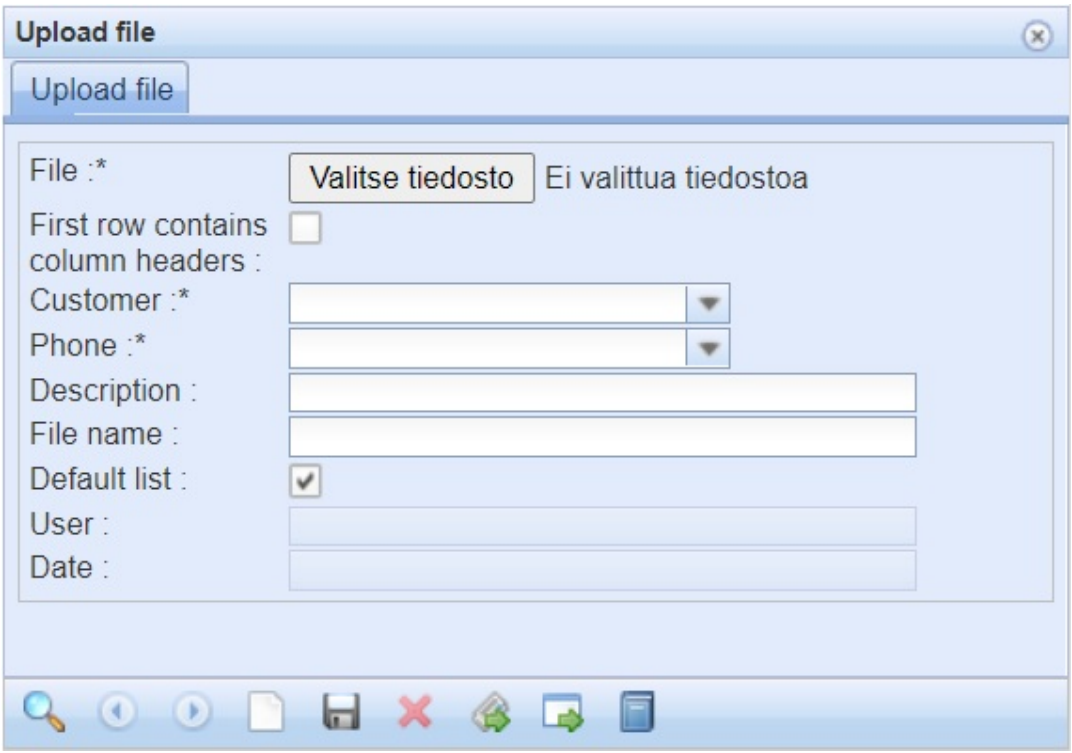
Sometimes there is a need to send messages to the same target group more than once. In this situation, it makes sense for you to save the target group as **Default recipients**.

Save as **Default recipients**:

1. Pick potential **Default recipients** to the **SMS Sending** form:



2. Click **Insert grid to database** button from the toolbar of the **SMS Sending** form.
3. Then **Upload file** and check the **Default list box** to save the default recipients:



1. Save your work and close the **Upload file** form.
2. Click **Default recipients** button in the **SMS Sending** form. The recipients are then added as the receivers of the SMS.

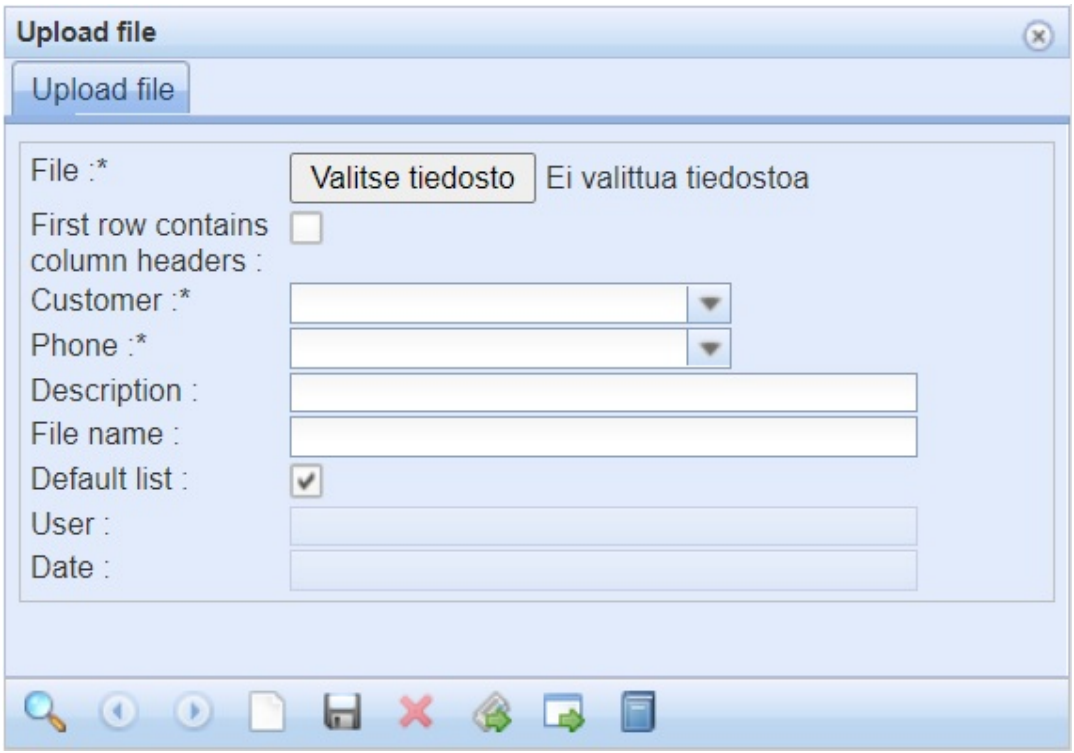
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Note, you can create several default recipients lists. Once you click the **Default recipients** button from the **SMS Sending** form, every file that has been marked as **Default list** in the **Upload file** will receive the SMS.

Read more about the **Upload file** form: Saving a target group.

Importing recipients from an external file

You can import a group of recipients to the SMS form from an external **CSV file**. On the SMS Sending form, click **Upload file** to import. This opens the **Upload file** form with no pre-filled fields.



1. Click **Browse** to search a local disk for the file to be loaded in the **File** field.
2. In the **Phone** and **Customer** fields, you must specify the CSV columns in which the names and phone numbers of the target persons can be found. For example, the format of the CSV file can be:

Name	Address	Number
Example person 1	Manhattan street 99	0401234567
Example person 2	Manhattan street	100;0501234567

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Note! CSV files must use UTF-8 encoding. You can ensure this, for example, by saving the file with the **Save as function of the Notepad** program and by selecting **UTF-8 in the Encoding field.**

This example uses the following selections on the **Upload file** form:

- The first row contains column headings
- Customer: In column 1 of the file
- Phone number: In column 3 of the file

When you have completed the selections on the **Upload file** form and selected the files, click **Upload file** to save the data included in the file in the database, or add them directly from the file to the target list on the SMS sending form by selecting **Import the data from the database** from the toolbar.

Customer roles

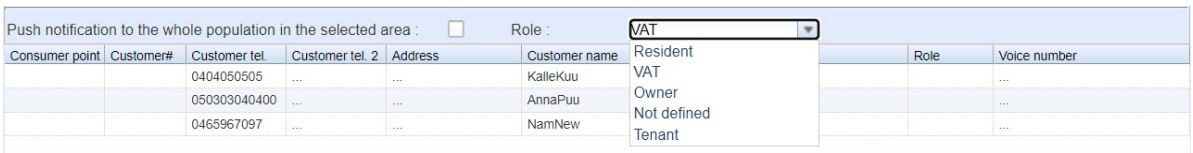
After selecting the recipients in the **SMS Sending** form, you can select the actual recipients from among them. Selection refers to filtering a set of customers based on the role assigned to the customer. The roles are:

- Owner = The owner of the Consumer point.
- Tenant = A tenant who pays rent.
- Resident = Consumer point user, for example, occupant of an apartment building.
- Not defined = Customer role is not determined.

Select **Push notification to the whole population in the selected area** if you want to send a SMS to all the roles.



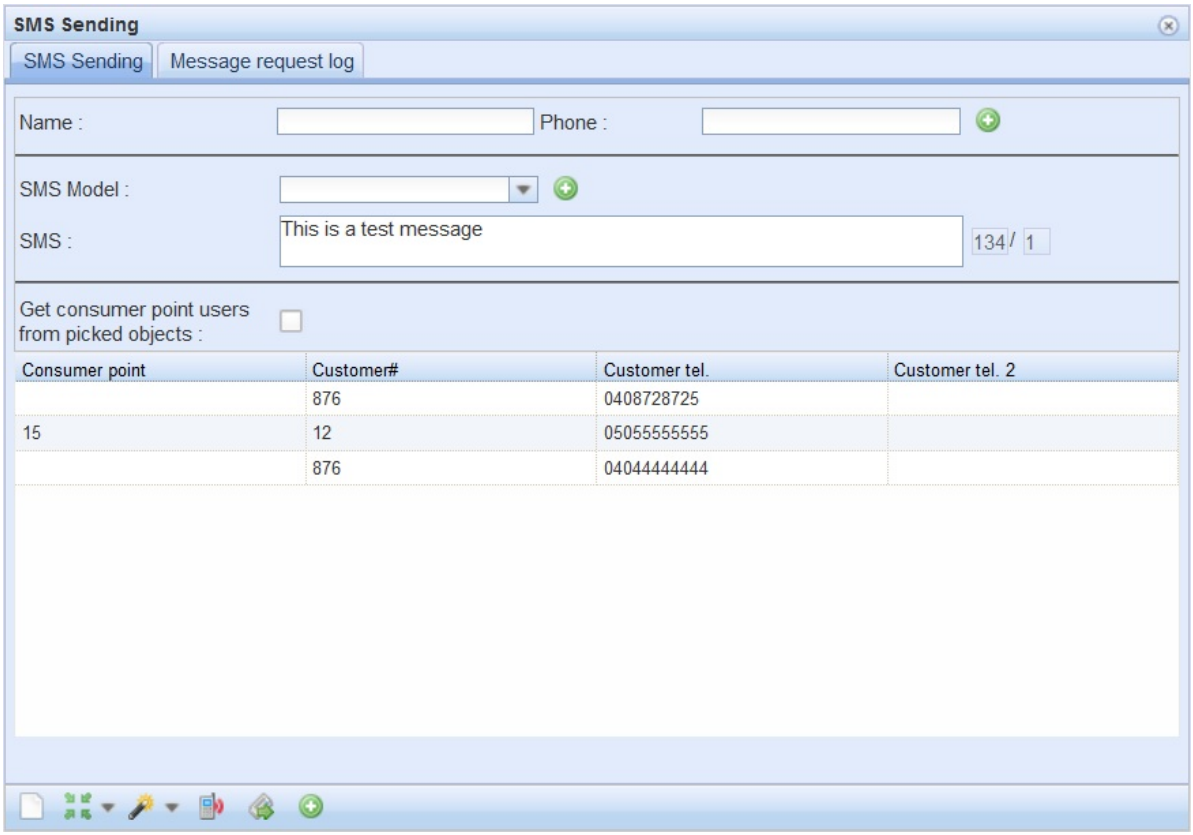
To filter recipients, turn off the **Push notification to the whole population in the selected area** setting, then select the desired customer roles. The recipient list below will be updated according to your selection.



Writing and sending messages

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When you have created a recipient group on the **SMS Sending** form, you can write and send messages. Enter your message in the **SMS** field and click **Send SMS** .



Take into consideration:

Sender drop-down menu: You can select the right organization as the sender for the message from the drop-down menu. It is possible to edit and choose different senders in the admin interface. The sender's name can only be **11 characters** long and words cannot contain special characters. If no selection is made, the sender is predefined.

Multiple same phone numbers/email addresses: If the same phone number appears in the list more than once, the message will be sent to this number only once. The number can repeat if, for example, the same **Consumer point** has been picked several times, or the number appears to the customer as another telephone number.

If the same phone number appears more than once in the object list, the message is sent to this number only once. For example, the number can be repeated if the same **Consumer point** has been picked several times on the form, or the number appears as another phone number for the customer. **If the customer does not have a saved phone number (Customer tel. or Customer tel. 2 columns are empty), they will not be sent a text message.**

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Length of the SMS

When you write an SMS, please note that the maximum number of characters in one SMS is 160. If the message has more characters, it will be sent in several parts. The figures displayed next to the message field provide information on the number of messages 126/ 2 . The latter number is the number of messages, whereas the first number is the number of used characters.

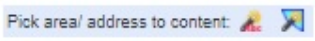
For example: There are 50 target persons and 3 messages required for the text. This means that 3 * 50 = 150 messages will be sent.

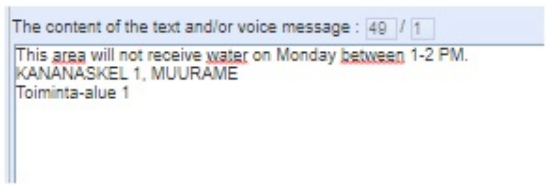
You will see a notification of a successful SMS sending in the **Info** window: **SMS sent.**

If a specific number occurs several times on the target group list, the SMS will be sent only once to this number. A number can be repeated, for example, if the same consumer point has been picked on the form several times, or if the number is a secondary phone number for a customer. **If no phone number has been saved for a customer** (the columns Customer tel. and Customer tel. 2 have no information), **no SMS will be sent to the customer.**

Pick an area/address

It is possible to add addresses and areas to a message by using the **Pick address** and **Pick area** tools. In this case, the end of the message will have area and/or address information, which you have assigned by cropping on the map.

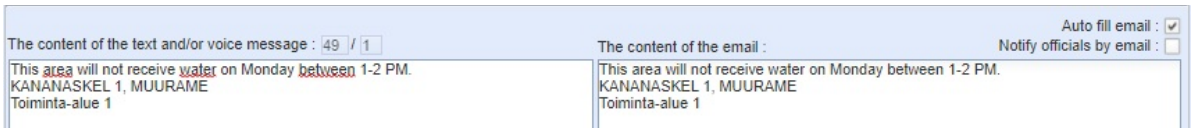




Sending a message to email

You can also send the messages to email. Check the **Auto fill email** -box and the content of the SMS message is copied to the email as well. Email is sent to recipients who have stored an email address in the **Customer** or **Consumer point** forms.

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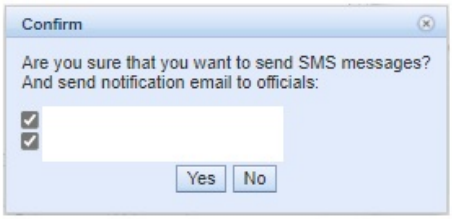


Notifying officials

The text message you typed in can also be sent to the email address of the local officials. The contact information of the officials is saved in the admin interface. When you send a text message, the **Confirm** window will remind that the message is send to the officials if you have the **Notify officials by email** check box active.







Linking Alerts to SMS (this function is subject to a separate order)

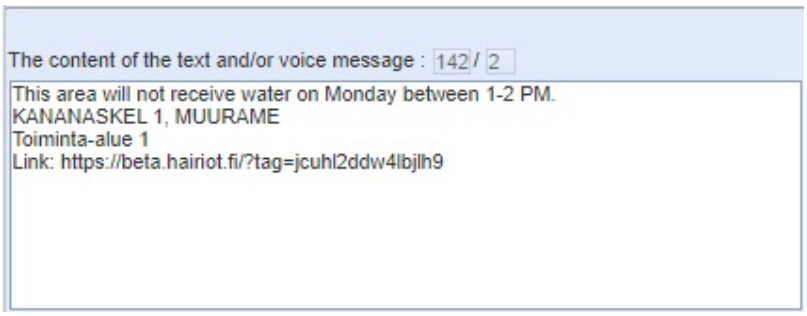
After adding a message and contact information to the **SMS** form, click **Alerts** to start.

Note that this function us subject to a separate order. If it's not activated the button is not shown.

The **Description** fields in the **Alerts** form is filled based on the SMS message created on the SMS form. In addition, the number of customers applied for the **SMS** form has been transferred to the **Alerts** form.

1. Create an **Alert**, like instructed in the Creating an Alert chapter.
2. Once the **Alert** has been created and saved, its linked to the **The content of the text and/or voice message** field:

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3. Send SMS by clicking the **Send SMS** button from the toolbar.

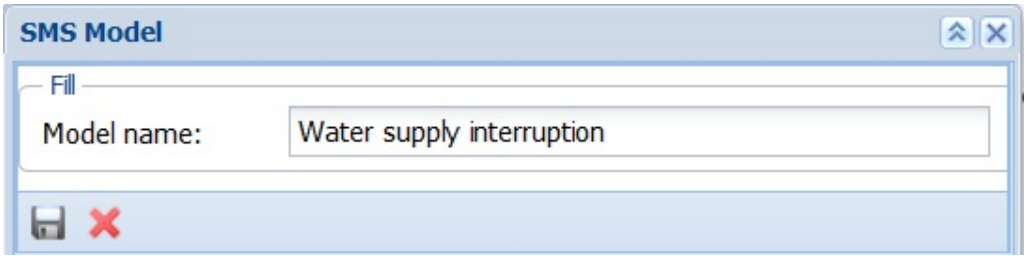
Two phone numbers for a customer

The Customer form lets you save **two phone numbers** (e.g. for work and home) for the same customer. When the numbers have been saved and the **2 SMS numbers** checkbox has been selected, an SMS is sent to both the customer's numbers. On the **SMS Sending** form, phone numbers, in this case, will be displayed in the **Customer tel.** and **Customer tel. 2** columns.



SMS templates

The text in the **SMS** field can be saved as a template for future messages. Create the text for the template in the **SMS** field and then click **Add new model** . This will open an **SMS Model** form. Enter a name for it in the **Model name** field.



To save the template, click **Save** . The SMS template will now be available on the form through the drop-down menu for **SMS Model**.

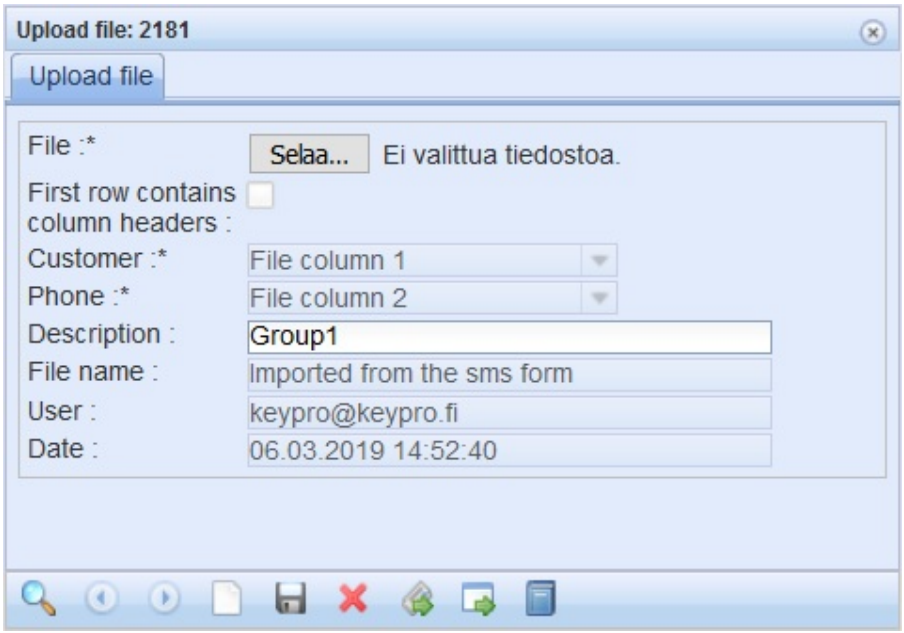
Deleting SMS templates: In the **SMS Model** menu, select the template you want to delete. Click **Add new model** . The template name will be displayed on the **SMS** form, and you can delete it by clicking **Delete** .

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Saving a target group

You can save the target groups on the **SMS Sending** form for later use. This function can be used, for example, when you want to send an SMS on the start and end of maintenance work to the same people. When you have saved the target group, you do not need to re-create it to send the second message.

To save a target group, click **Insert grid to database** at the bottom of the form. This will save the target group directly and the **Upload file** form will be opened with pre-filled information.



We recommend that you add a **Description** of the file for searches that will be carried out later.

To export a target group to an external file, click **Write the file from the database** .

Message request log

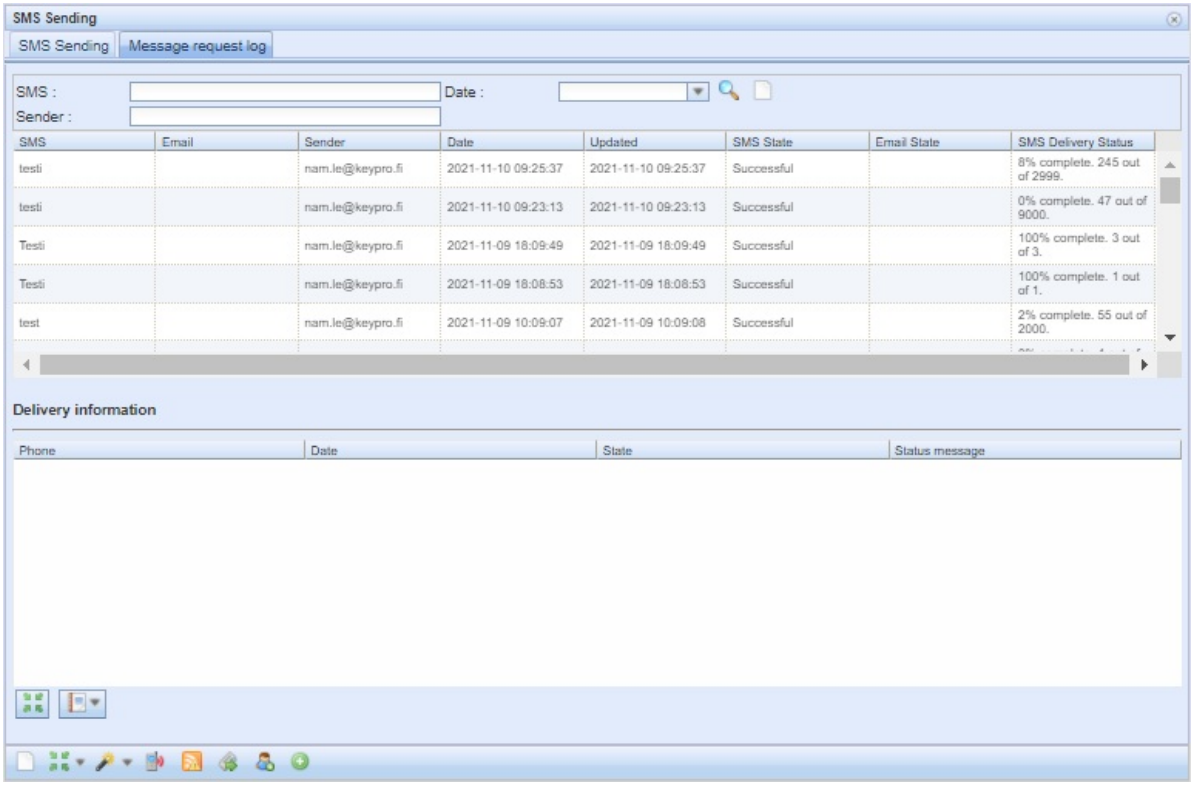
Information on sent text messages is displayed on the **Message request log** tab of the **SMS Sending** form. You can search the log using the tools at the top of the tab**,** either by **SMS** content or by **date** sent.

You can find the **SMS State** and **SMS delivery status** columns from the Message request log tab. Here you can follow the progress of the delivery.

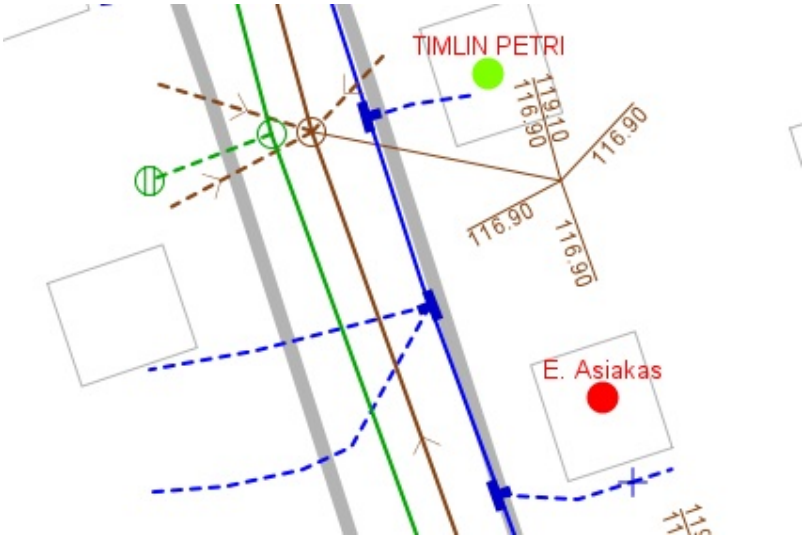
- **SMS State** shows the current state of the message.
- **SMS Delivery Status** column tells you real-time status of the delivery. The status is indicated in percentage. When you click a column, it

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updates the percentage. The upload is complete once it reaches 100%.



Click a message in the upper section of the tab to view the detailed delivery information in the lower section. This data can be **exported** from one program to another using the **Locate consumer points** and **Export** **tools.** The **Locate consumer points** tool highlights the consumer points on the map in red or green according to successful or failed delivery.

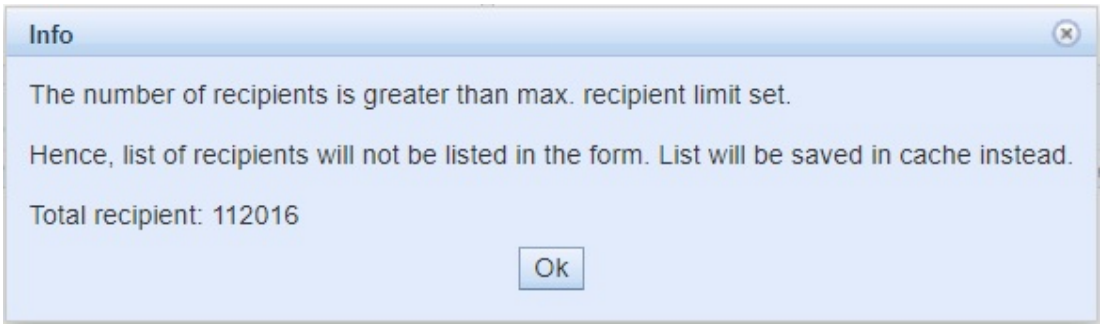


Mass sending SMS

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KeyAqua's **SMS sending** form enables you to send messages to a large number of people. Mass sending feature is activated when more than 2,000 **Consumer point users** are transferred to the **SMS sending** form. This means it is activated automatically and you don't have to do it manually. **SMS sending** feature allows you to send up to 200,000 SMS messages to recipients at once.

1. When you have saved the data of more than 2,000 users to the **Access Point Users** form, click the **Send SMS** button to export it to the **SMS sending** form as usual.
2. The system will ask you to verify this action. After that, an info message will pop-up and tells you that the limit of recipients is greater than the set limit.
3. Click the Ok button to continue. The same message will appear if you choose to collect the recipients by using the **Pick** tool.



4. When the number of recipients is greater than the max, the **User info** will not appear in the **SMS sending** form and it remains empty. The list of **User info** will be saved in cache instead and you can continue using the form normally.

The speed of sending SMS

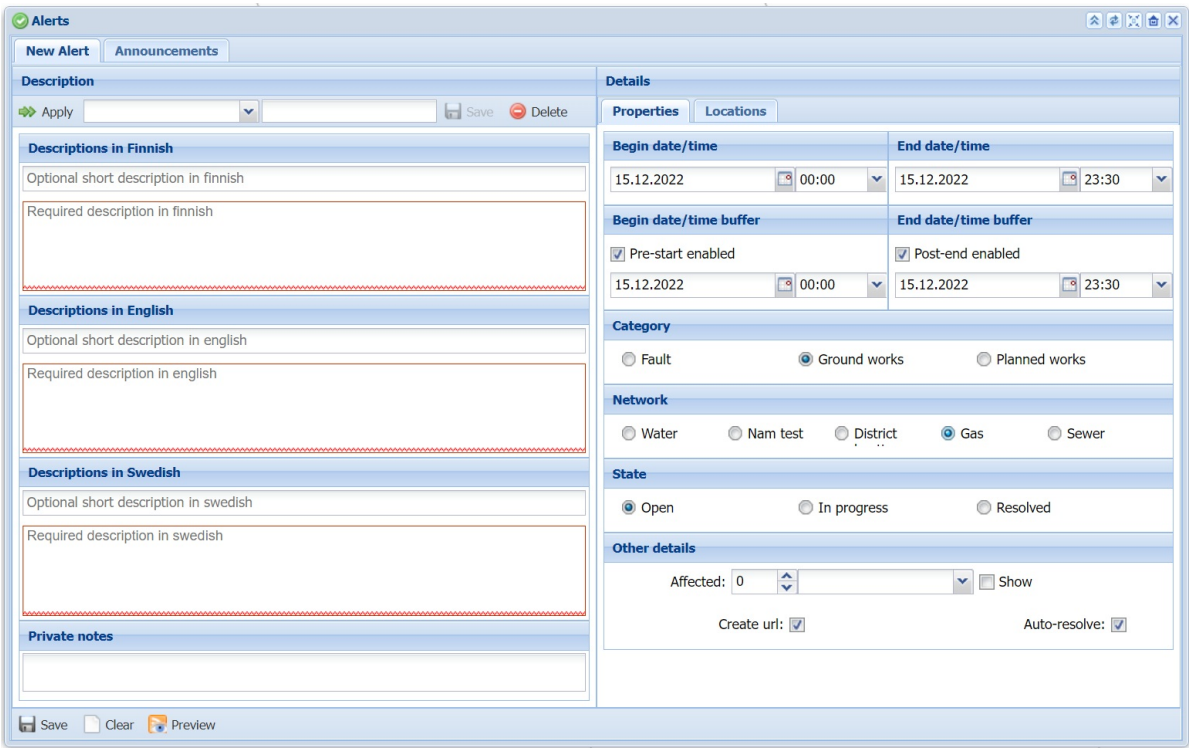
Approximately 30 messages can be sent per second. The connection speeds presented below in the table are estimate but give a good direction on the speed of mass sending SMS. However, connection speeds can be affected by poor internet connection.

Number of messages	Time
2000	Approx. 1 minute
10 000	Approx 6 minutes
100 000	Approx 1 hour

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ALERTS (this function is subject to a separate order)

Click **Alerts** to open a separate form that is used for managing the affected alert areas and alerts. On the **Alerts** form, you can specify and save information about planned construction sites, distribution breaks, and other planned disruptions, as well as their start and end times. The form is used to record information about the category and status of the alert and the network type. The form can be used to determine the number of customers affected by the alert.



Creating an alert

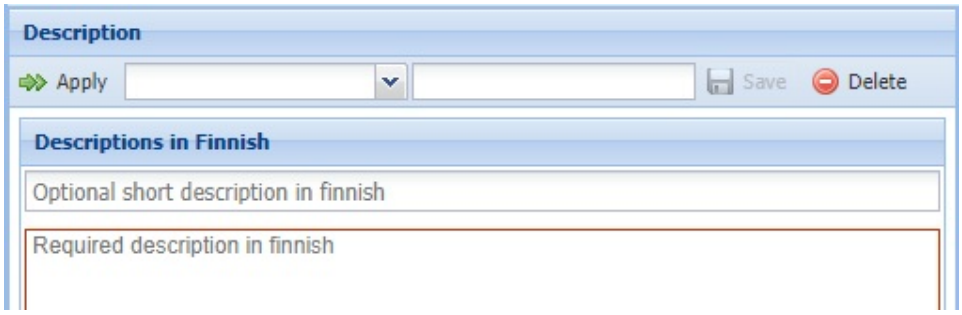
1. Create a new message or search for a pre-saved message template, as in the chapter Creating a new message and a message template.
2. Enter more detailed specifications for the alert in the **Details** tab. Read more in chapter Details.
3. Give the alert a location like instructed in chapter Locations.
4. Press the **Save** button in the lower left corner to save a new alert.
5. The created alerts can be found from the **Announcements** tab.
6. By pressing **Clear** you can clear the form from all the info.

Creating a new message and a new message template

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You can write alert messages in the **Description** section of the **New Alert** tab. You can report in Finnish, English and Swedish, because the public alert information website supports these languages.

NOTE! The Finnish description is also copied to the English and Swedish fields. You can translate the text to match those languages



1. Write a headline for the message (this field is optional).
2. Enter the description text in the fields below. It is not possible to save the form without filling in the required description message field. If you do not want to save the message template, continue without saving and move to Details.

OR:

1. To save a new message template, enter a name for the message template and press **Save** : 

2. To delete the Alert, simply press **Delete** .

NOTE! If you have started creating an Alert via the SMS form, the **Description** fields are automatically filled in according to the typed text message.

You can write confidential or private information about the Alert to the **Private notes** field. It can only be seen by your organization and cannot accidentally be published to the customers or citizens.



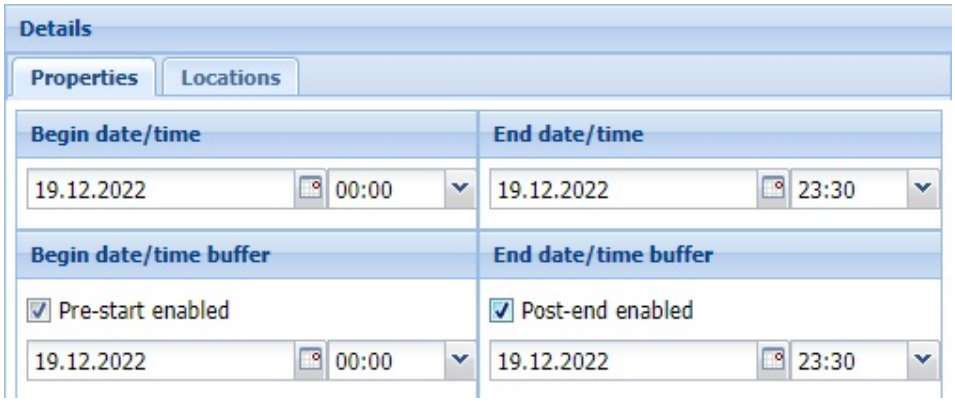
Details

In the **Details** section, the information related to the alerts is specified.

The **Begin date/time buffer + Pre-start** and **End date/time buffer + Post-end:** Define the start and end dates of the alert in the calendar and time menus.

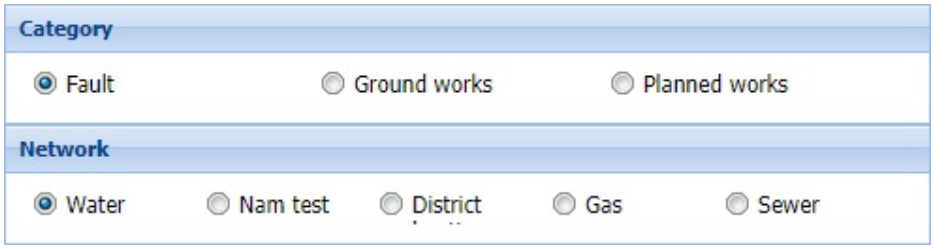
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If you select the checkboxes **Pre-start enabled** and **Post-end enabled**, the date and time fields are also activated. With the **Pre-start enabled**, you may inform customers about faults, ground works or planned works in advance. You can also inform after the alert by selecting the **Post-end enabled** check box, in which case the information will be displayed for the period you selected.



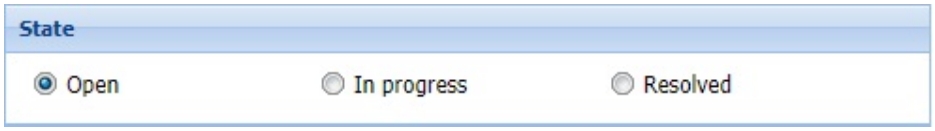
Category and Network

Choose the right category fort the alert. Options are **Fault**, **Ground works** tai **Planned works.** Also choose the network type for the alert:



State

Define the state of the alert. Is it **Open**, **In progress** or **Resolved:**



Alerts which are in **Open** and **In progress** state are shown on the map. However, if the alert is in **Resolved** state it will not be shown on the map.

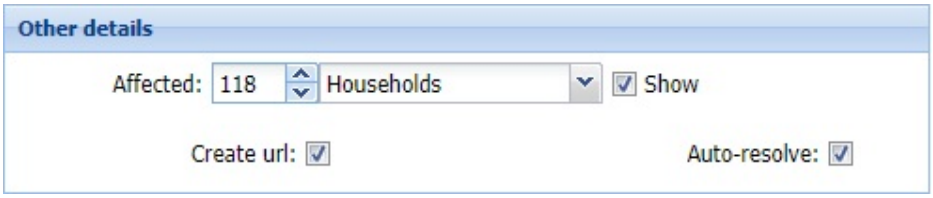
Other details

You can give more details about the alert in the **Other details** section.

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In the **Affected** field, specify the number of customers who will be affected by the construction, disruption or supply interruption. The **Show** checkbox determines whether or not the information is published in the alert website.

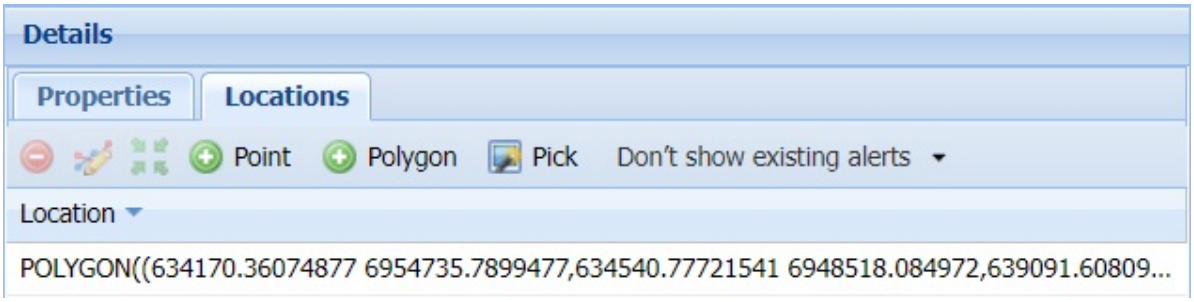
The **Create URL** checkbox creates a link to the alert for the notification. The link allows customers to see the alert message and maps on a separate alert information website. For further information on alerts, please see the Sharing information about alerts chapter.



NOTE! If you have started creating an alert through the SMS form, the number of objects will be automatically replenished according to the number of recipients of the text message. For more information, see Linking an alert to SMS.

Locations

Use the **Locations** section to define the location of the disruption, construction, or supply interruption on the map. Open the **Locations** menu from the bottom-right corner of the **Alert** form.



Point: Click on the map to add a point object location for the alert within your operational area. You can add several point objects.

Polygon: Click on the map to add a polygon-type location for the alert within your operational area. You can add several polygons.

Pick: Pick an existing area geometry from the map.

Don't show existing alerts menu

1. **Don't show existing alerts**: Alerts are not displayed on the map.
2. **Show active alerts**: Active alerts are displayed on the map.

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3. **Show all alerts**: All alerts that have been created are displayed on the map.

You can **Modify** a location, **Locate** it, or **Delete** it.

Editing and deleting templates

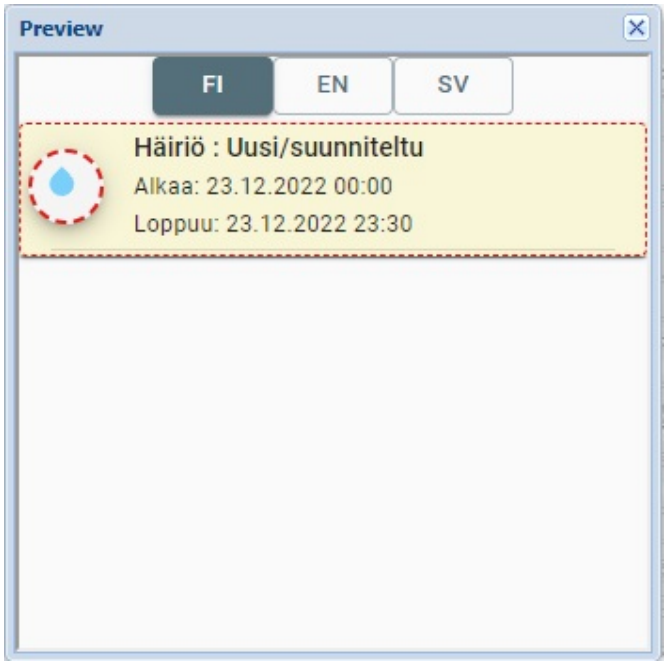
1. **Choose** a template from the drop-down menu based on its description:
2. Click **Apply** to have the template information completed in the fields below for you to edit.

OR:

Click **Delete** to delete the template.

Preview

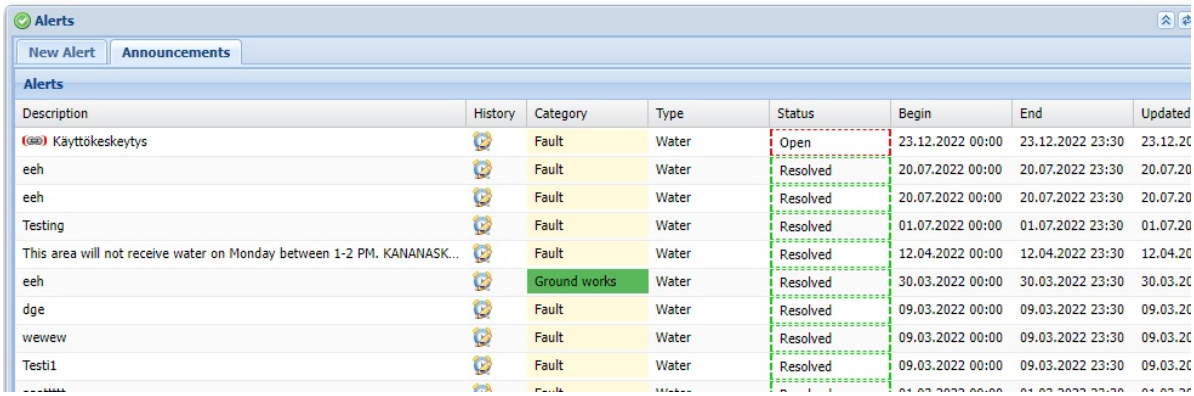
At any stage of creating an alert, you can preview the alert message you have made by pressing the **Preview** button at the bottom of the form.



Saved alerts

The alerts are stored on the **Announcements** tab. The table presents the alert description, category, type, status, begin date, end date, and the date the alert was updated. If the alert is connected to a SMS service, the alert will begin with a symbol .

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Each category **type** (Fault/Ground works/Planned works) may be assigned a background color that is used when displaying the information on the alert information map. Similarly, the alert state (open/in progress/resolved) can be assigned a color that is also used when displaying information on the alert information map.

Edit alerts

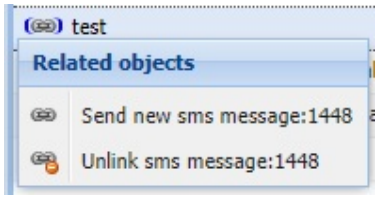
Select the alert you want to edit and click **Edit alert** . The warning will open on a separate **Edit alert** tab, where you can edit the information. When you are ready, click **Save** to save changes.

Deleting alerts

Select the alert(s) you want to delete. Click **Delete** . The program will ask you to confirm the deletion.

Resending an alert

It is possible to send a new text message to those alerts that have been connected to the SMS service, for example, due to the end of the disturbance or its continuation. Right-click on the alert row with the symbol and select **Send a new SMS** . The program will take you to the **SMS** form, where you can format and send a new SMS to your customers.



The **Unlink sms message** option removes the SMS link from the alert.

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New URL

You can **create a new URL** for one or several alerts. Use the Shift or Ctrl key to select the alert rows for which you want to create a new URL. Then click **New url** .

This is a useful function when you want to link more than one alert so that they are available through the same link.

Linking

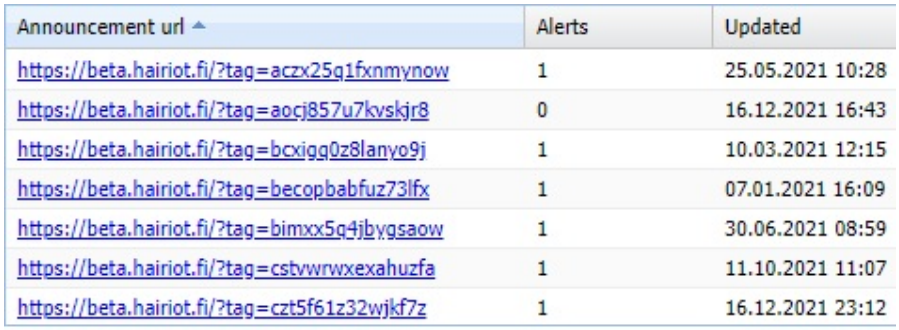
You can add additional alerts to the selected alert link. In the **Links** section, click the link to which you want to add existing alerts. Use the Shift or Ctrl key to select from the Alerts list the alerts that you want to link. Click **Link** .

Unlink

If you have created a link to an alert and want to remove it, click **Unlink** . If the function is not available, the alert has no linking.

Links section

In the **Links** section, you can see the alert links, the number of alerts, and the dates for alert updates.



Announcement url	Alerts	Updated
https://beta.hairiot.fi/?tag=aczx25q1fxnmynow	1	25.05.2021 10:28
https://beta.hairiot.fi/?tag=aocj857u7kvskjr8	0	16.12.2021 16:43
https://beta.hairiot.fi/?tag=bcxigg0z8lanyo9j	1	10.03.2021 12:15
https://beta.hairiot.fi/?tag=becopbabfuz73lfx	1	07.01.2021 16:09
https://beta.hairiot.fi/?tag=bimxx5q4jbygsaow	1	30.06.2021 08:59
https://beta.hairiot.fi/?tag=cstvwrwxexahuzfa	1	11.10.2021 11:07
https://beta.hairiot.fi/?tag=czt5f61z32wjkf7z	1	16.12.2021 23:12

Delete Select a link and click **Delete** to delete the link. The program will ask you to confirm the deletion. After the deletion of the link, the alert will no longer be displayed on the public alert information website.

FilteredUse the **Filtered** menu to select whether the **Links** section displays only the link for the selected alert (**Filtered**) or the links of all alerts (**All**).

Quick buttons on the form

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The quick buttons in the top-right corner of the **Alerts** form include the following functions:

You can minimise the form to the **Favorites** bar by clicking .

The **Reload config** button is useful when the **Alert** form cannot connect to a server. In this case, you can see the symbol in the top-left corner of the form. The settings have been reloaded when you can see the symbol .

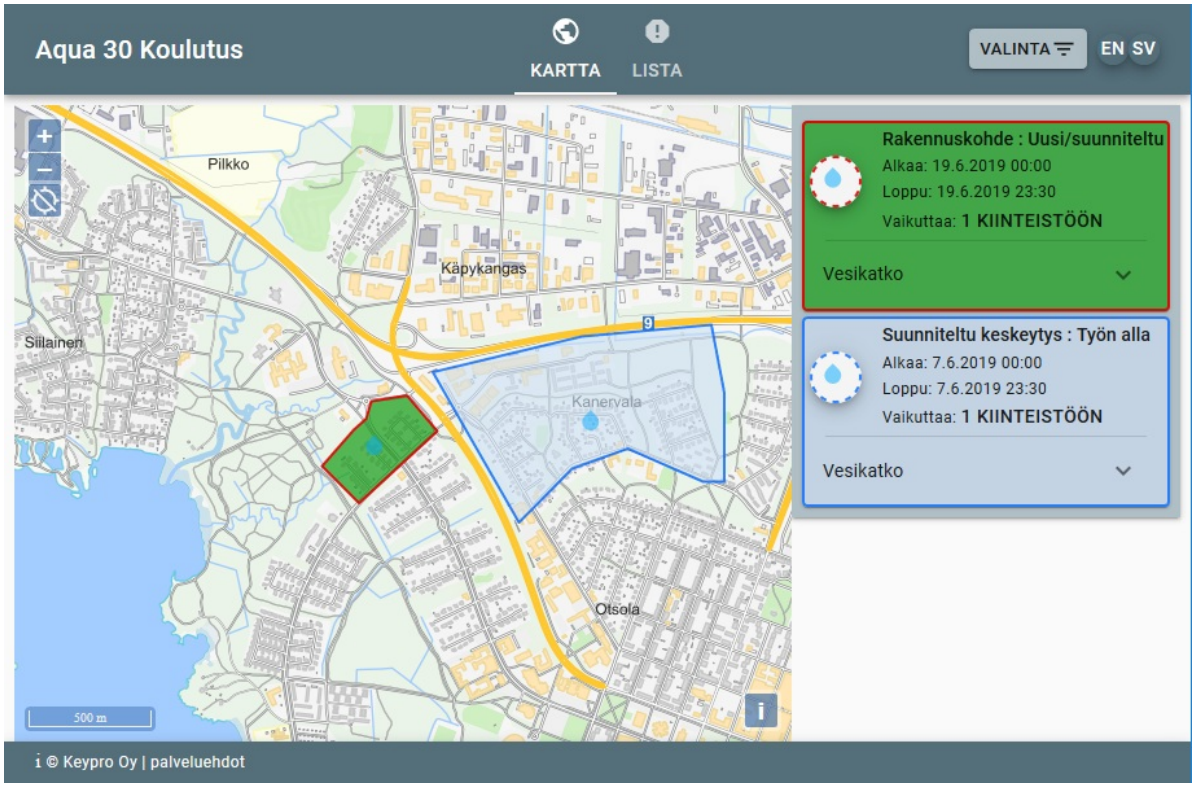
The **Zoom to operational area** button centers the map to your operational area.

Click **Show tenant url** to open an alert map, which displays all alerts with the status **Open** and **In progress**.

Click to **close** the form.

Sharing information about alerts

The **Alerts** tool is linked to a separate public website on which the actual information sharing takes place. The link to the **Alert information website** can be published on the websites of operators. Alerts can be customer and operator-specific with information including the affected services, the start time, the estimated repair time, the affected area, and phone numbers for on-call technical support.



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Customers located in the affected areas can also be informed by using **text messages**, which can include a link to the alert information website.

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SPATIAL UPLOAD (this function is subject to a separate order)

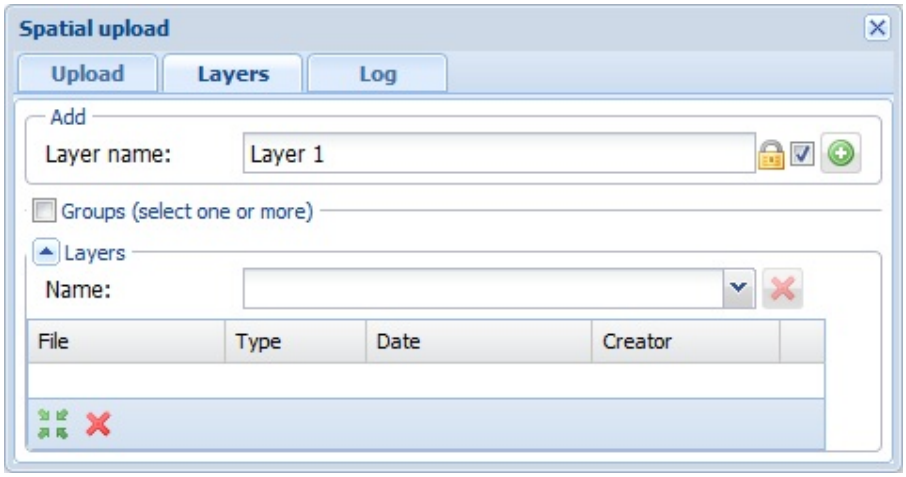
Add background maps using the **Spatial upload** tool. Organise and add new background maps to the background layer levels and define the symbology* for imported files (*Esri™ SHP only). Background maps imported into the system are shared or available for a specific group or user. In the main toolbar, click **Spatial upload** .

The **Spatial upload** tool supports the following file formats:

- Esri™ SHP
- Bentley MicroStation™ dgn (V8)
- Autodesk AutoCAD™ DWG
- CSV files (X;Y; name; colour; size); for more information, see the chapter Material in CSV format.

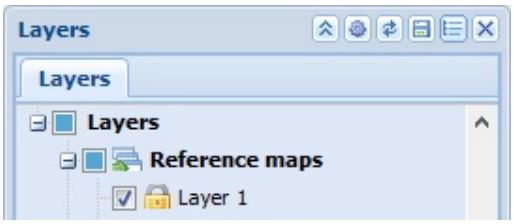
Managing layers

To upload background maps, either select an existing layer or create a new background layer. You can manage layers on the **Layers** tab. To create a background map layer, enter its name in the **Layer name** field and click **Add layer** . The layer will appear in the **Reference maps** section on the **Layers** form. You can organize the background map layers and their hierarchy.



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You can create user-specific or group-specific background maps. Any layers you create are by default shared, and they are marked with the unlocked lock icon . You can define a layer as private by selecting the checkbox. The icon is replaced with a locked lock , and the layer you created is not visible to others. When you have defined the level you created as private, the **Groups** checkbox is activated. If you want some specific group to see the background map you created, select the name of the group in the drop-down menu for **Group**. Admin users can create groups and add users to the groups.



Downloading background maps

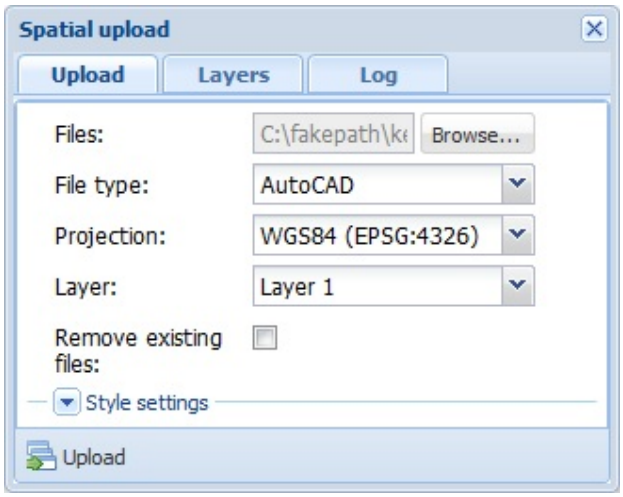
1. Select the **Upload** tab.
2. Click **Browse** and select the file you want to upload. If you are uploading an ESRI **shp** file, also select the **dbf** file.
3. Check the file type before uploading. This field is usually filled in automatically so that it matches the file you selected.
4. The name and EPSG code of the coordinates are displayed in the **Projection** menu. **Select the projection applicable to the file that you want to upload.**
5. Select the background map **Layer** to which your file is to be added.
6. Select **Remove existing files** if you want the layer to include only the information included in the files that are being uploaded.
7. Define the style settings applicable to the object types (Esri™ SHP only).

   Tip:

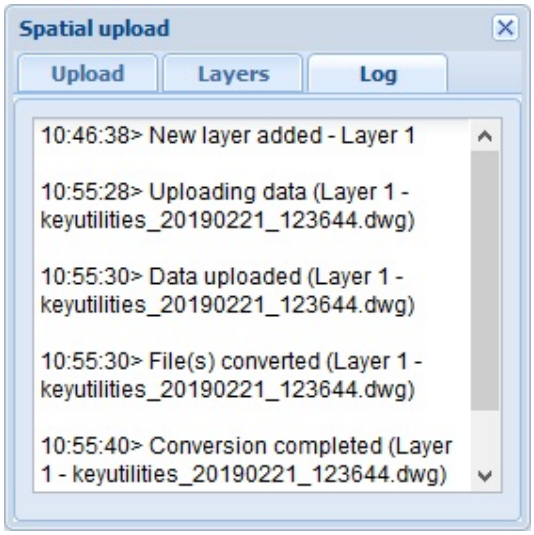
   If your file includes objects with various style settings, you might have to separate them into different files based on their symbology.

8.

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9. Click **Upload** . The progress bar indicates the status of the file upload. Note that it could take several minutes to upload a large file. The **Log** tab gives you the sight of the uploading process.
10. When the file upload is complete, the following notification is displayed: **Data is ready, zoom to extent?** Click **Zoom** and check the result on the map.



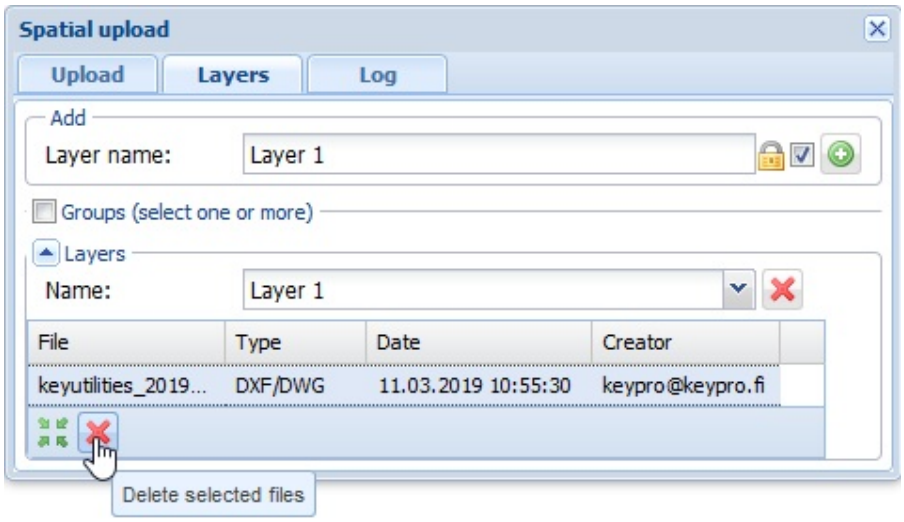
11. When the file has been uploaded, it appears on the **Layers** tab of the Spatial upload form.

Removing the background map

1. Select the **Layers** tab.
2. Expand the **Layers** section if it is hidden.
3. In the drop-down menu for **Name**, select the layer where the background map you want to delete is located.
4. Select the file you want to delete and click **Delete selected files** .

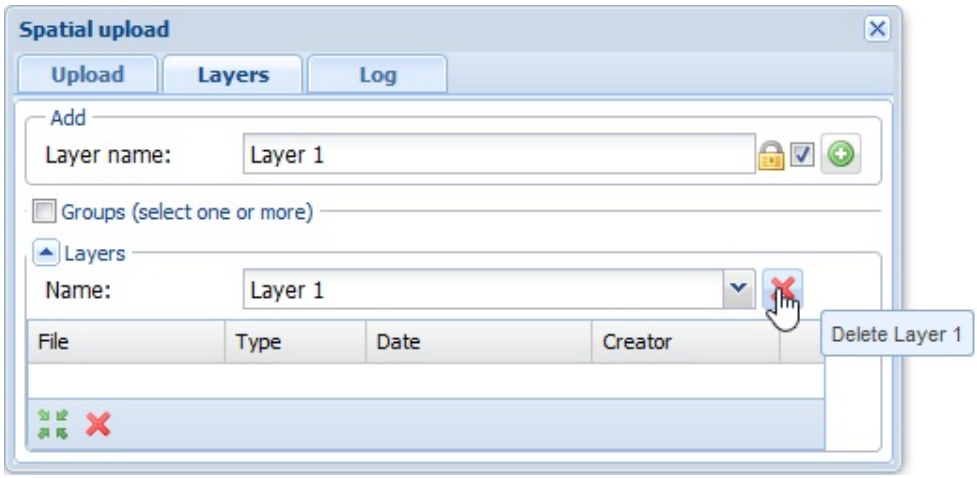
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5. Confirm and check the result on the map.



Deleting a background map layer

1. Select the **Layers** tab.
2. In the drop-down menu for **Name**, select the layer you want to delete.
3. Click **Delete** .
4. If there are files attached to the level, the following notification will be displayed: **Layer** If you are sure that you know what you are doing and you still want to delete the layer, click **Delete** to confirm the action.



Material in CSV format

Rules for importing CSV files:

1. Fields are separated by semicolons (*;*).

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2. No column headers are used.
3. Rows are in the following format: X;Y;[TEXT];[COLOUR];[SIZE]
4. The TEXT, COLOUR, AND SIZE columns can be empty.
5. If TEXT is empty, a point object is created. Otherwise, free text is created.
6. If COLOUR or SIZE is empty, default values are applied.
7. COLOUR is an RGB value, such as “255 255 0”.
8. For example:

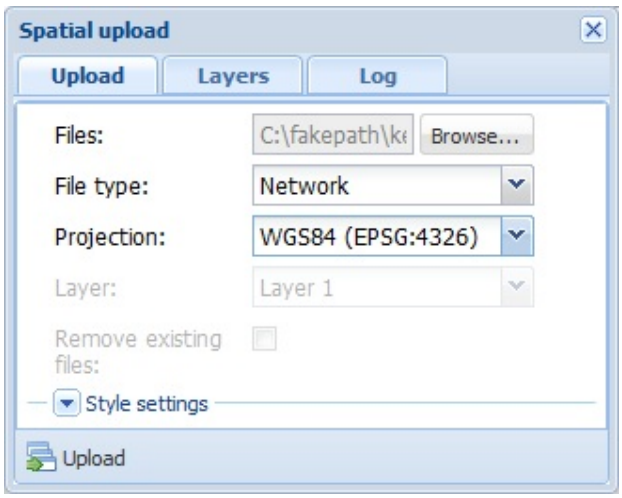
- 3458126;6705024;text1;255 255 0;10
- 3458126;6705024;text2;255 255 0;10
- 3458226;6704924;;255 255 0;10
- 3458226;6704924;;255 255 0;
- 3458226;6704824;;;
- 3458226;6704824;text3;;
- 3458226;6704724;text3;;20

TIP: If you want to create both point objects and free text, create two versions of the file – one containing the texts and another where texts are empty – and upload both files to the same layer.

Uploading network objects (settings must be defined through the admin user interface)

1. Select **shp and dbf files, or a zip file** containing such files, as the files.

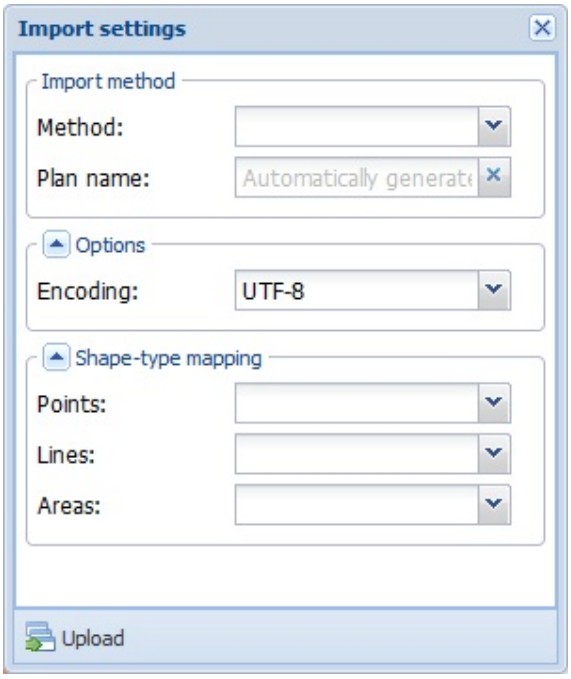
2. Select **Network** as the file type.



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3. Click **Upload** .

4. On the **Import settings** form, select **Method**



5. Check that the mappings are correct.

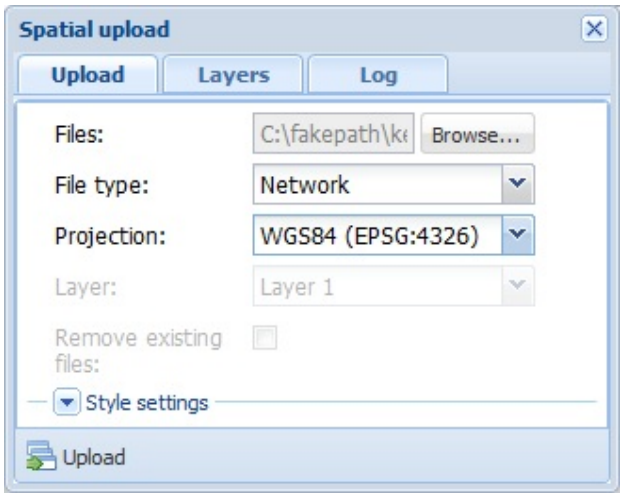
6. Click **Upload** . The progress bar indicates the status of the file upload. Note that it could take several minutes to upload a large file.

7. When the file upload is complete, the following notification is displayed: **Data is ready, zoom to extent?** Click **Zoom** and check the result.

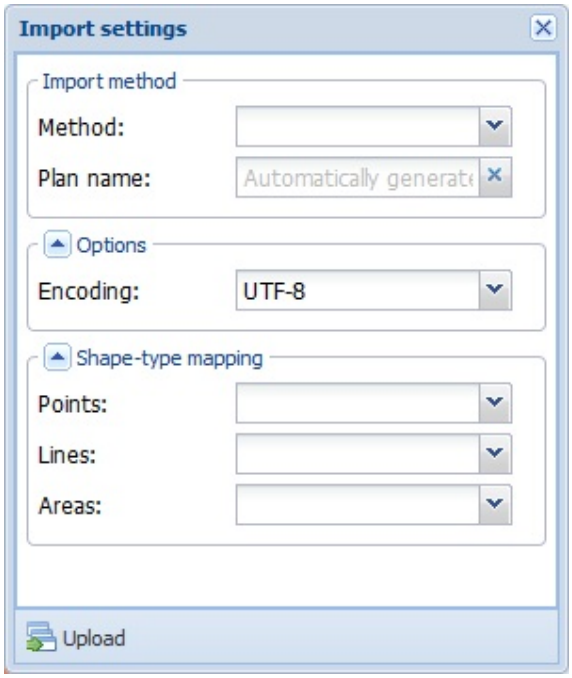
Uploading network objects by using Area import (Settings must be configured through the admin user interface)

1. Select **shp** and **dbf** files, or a zip file containing such files, as the files.
2. Select **Network** as the file type.

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3. Click **Upload** .
4. On the **Import settings** form, select **Area import** as the **Method**.



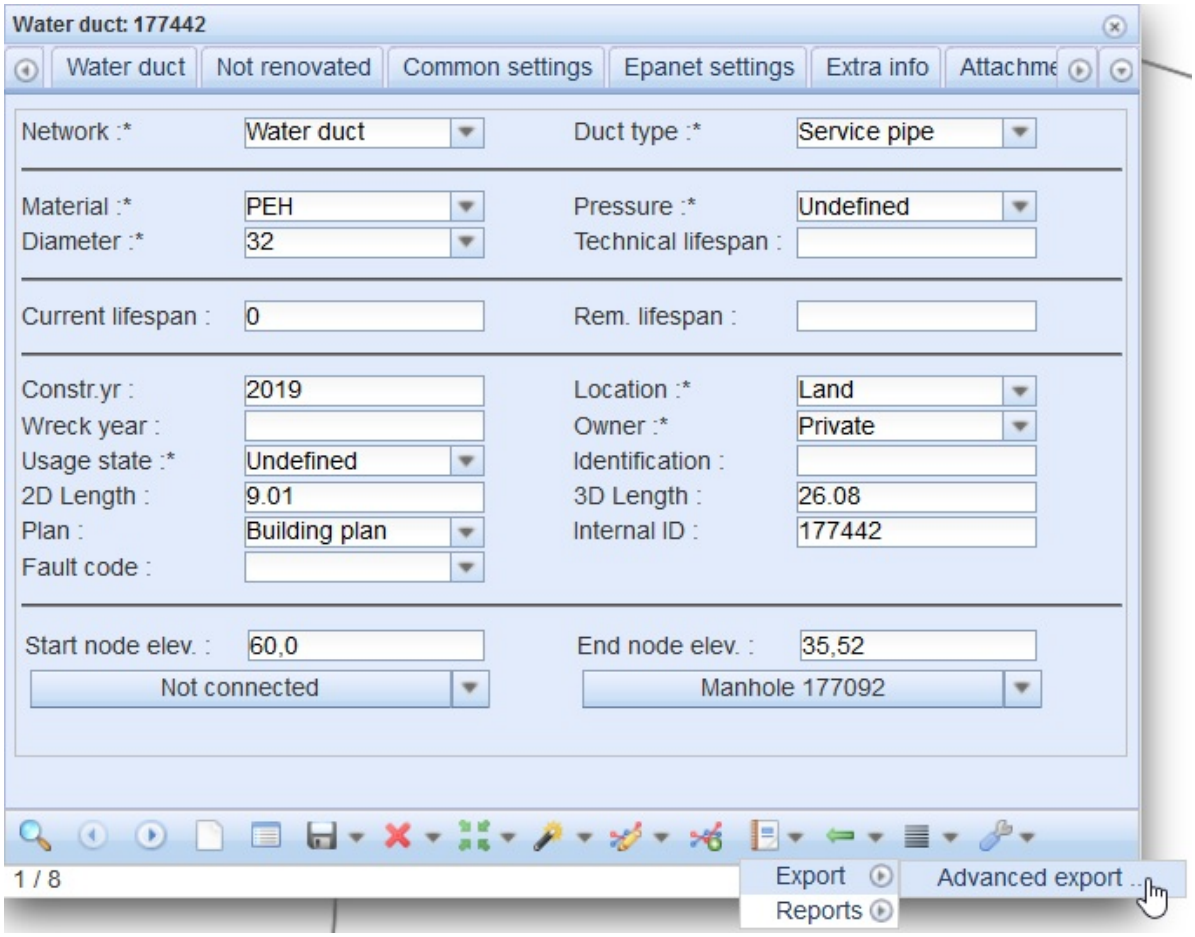
5. Check that the mappings are correct.
6. Click **Upload** . The progress bar indicates the status of the file upload. Note that it could take several minutes to upload a large file.
7. When the file upload is complete, the following notification is displayed: **Data is ready, zoom to extent?** Click **Zoom** and check the result.

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EXPORTING OBJECTS (this function is subject to a separate order)

Exporting objects to external file formats (this function is subject to a separate order)

You can export **KeyAqua** objects to **AutoCAD** (dwg, dxf), **ESRI** (shp), **Microstation** (dgn), and **GT Format** (xyz) formats. You can also export **diagram objects**, **area objects,** and the **area borders of plans** to these formats. (Licence customers can use this function if the application server is allowed to open connections.)
Use either the **Info** form or the **object forms** to export network and annotation data to one of the formats listed above.

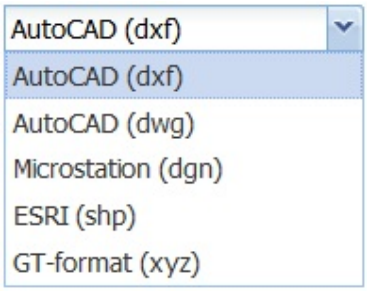


1. In the drop-down menu for **Export** , in the **Export** menu, select

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Advanced export... to export the objects to another file format.

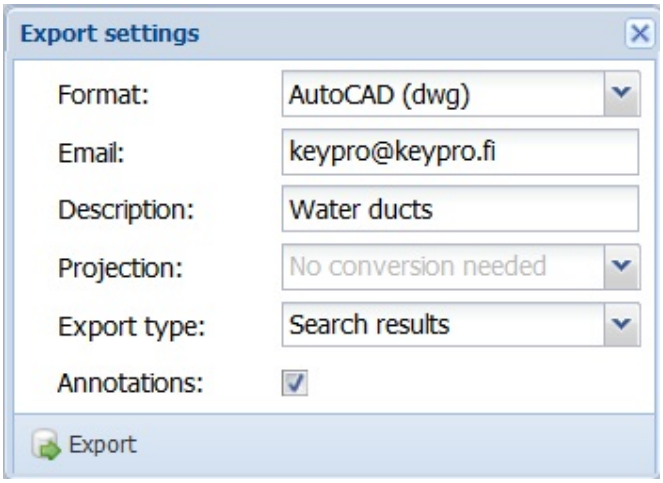
2. On the **Export settings** form displayed, select the export Format.



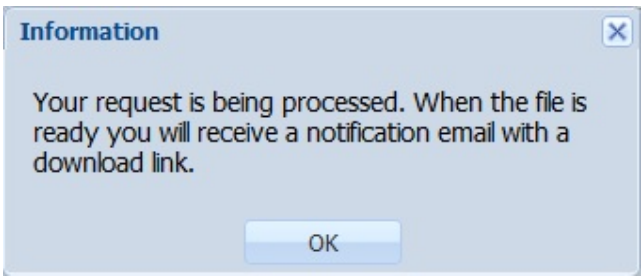
3. Enter a **description** of the export.
4. Select the **projection** applicable to the file that you want to create.
5. Select whether **annotations** are exported.

Note! Email addresses are defined/linked to user ID's through the admin user interface. If the intention is that a user does not have rights to use this function, the email address field must be left empty.

Admin users can edit the email address to which the link for downloading data is sent.

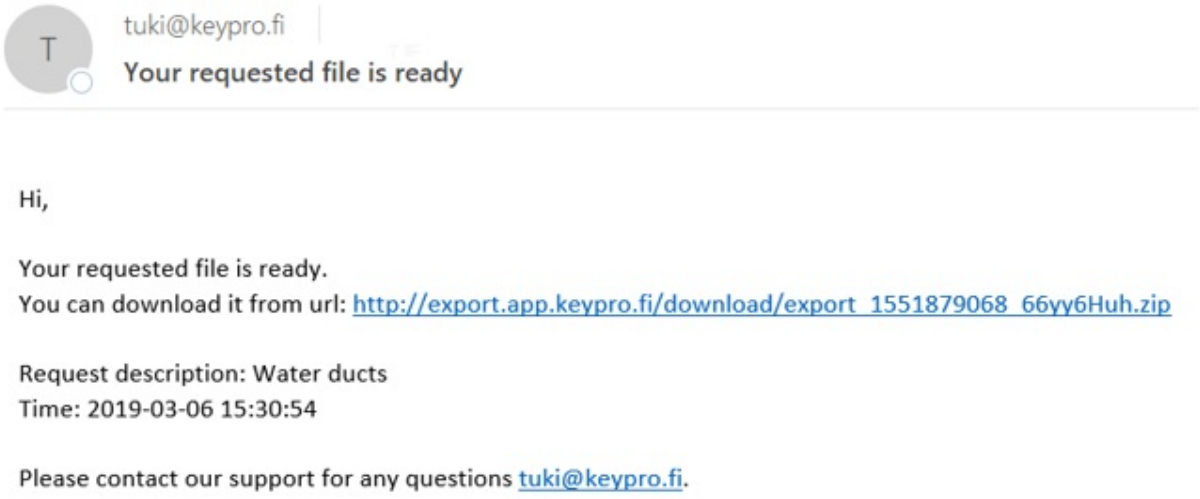


Click **Export** to **accept the data export.** The system displays a notification that your request is being processed.



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When the file has been processed, the system will email the user a link for downloading the file.

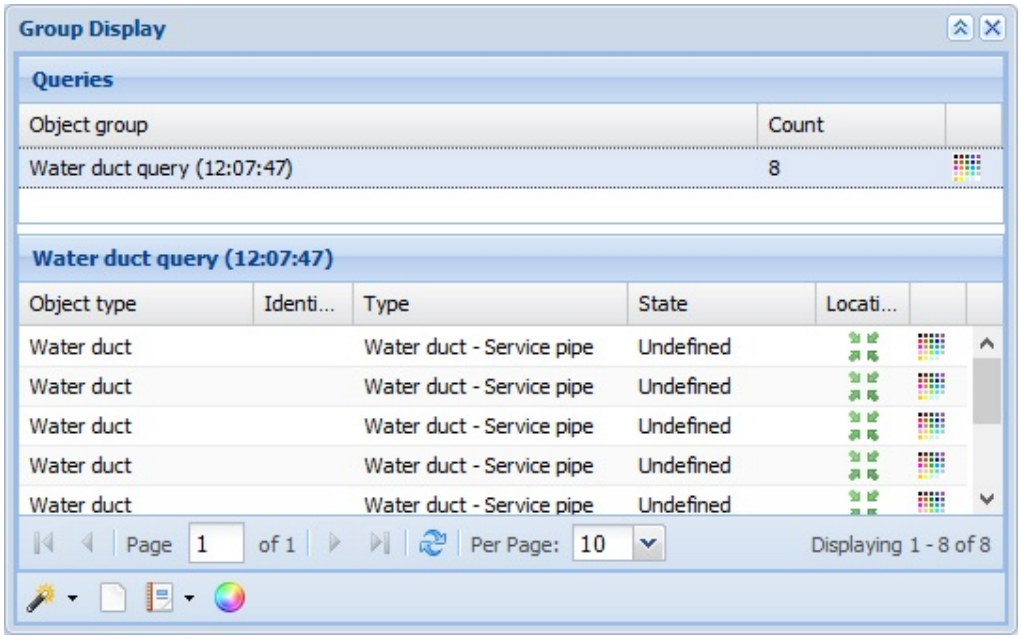


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GROUP DISPLAY AND USER THEMES

The **Group display** function helps you view various object groups. You can use it to edit and highlight a group or its objects, or to combine a group with another group. In addition, you can open the group from the object form and the object forms lists.

Groups are groups of searched objects or combinations of them.



Creating groups

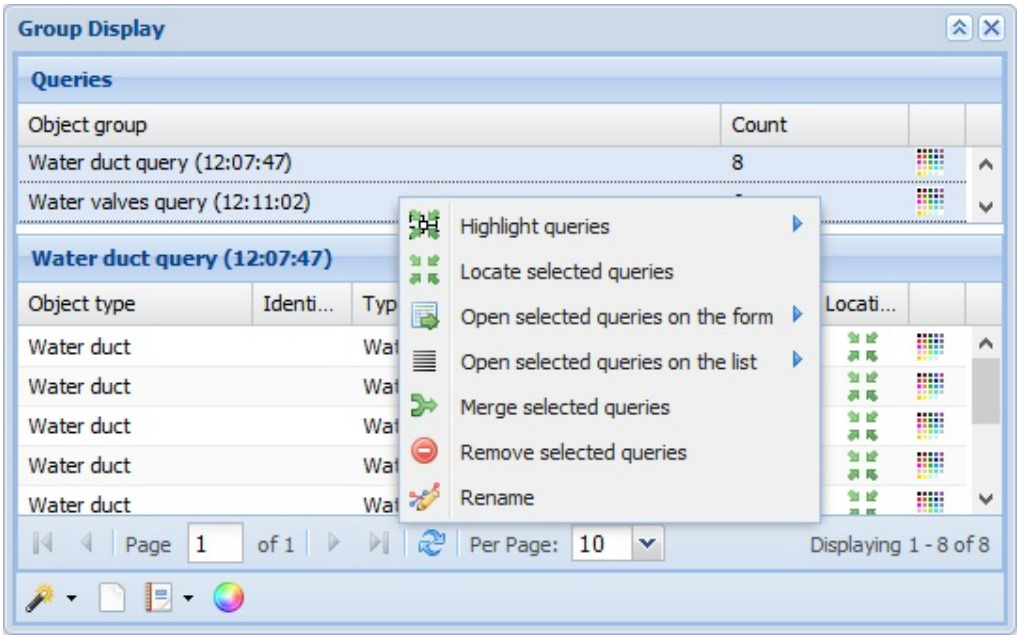
Groups can be created in many ways:

1. Add groups to a list using the **Show in group display** function in the drop-down menu for the **List** tool. Further information is available in the chapter Show in group display.
2. Picking objects from the map with the **Group display** form. Use the **Pick from map** tool, with which you can, for example, define an area on the map and include the objects in that area.
3. View the results of the **Info** query in a Group display.
4. Retrieve the objects of a **Plan** – see the chapter Show plan objects in a group display.

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Merging object groups

1. On the list, select the groups that you want to merge.
2. In the context menu, select **Merge selected queries** .



Renaming an object group

1. To rename a group, either double-click the object group or click the right mouse button and select **Rename** .
2. Enter the new name in the **Object group** field.
3. Complete editing by clicking outside the field.

Highlighting groups

1. Select the colours used for highlighting the groups.
2. In the context menu, select **Highlight queries** to highlight the selected groups and groups for which you assigned a colour. Groups with no colour assigned are highlighted using the default colour. To apply a specific highlight colour for the selected groups, select the colour in the sub-menu. The items outside the selection are then highlighted using the default colour.

Locating queries

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1. Select the group(s) you want to locate.
2. In the context menu, select **Locate selected queries** .

Opening groups on forms and lists

1. Select the group or groups you want to open
2. a) Open all search results by selecting **Open selected queries on the form** or **Open selected queries on the list** .

or:

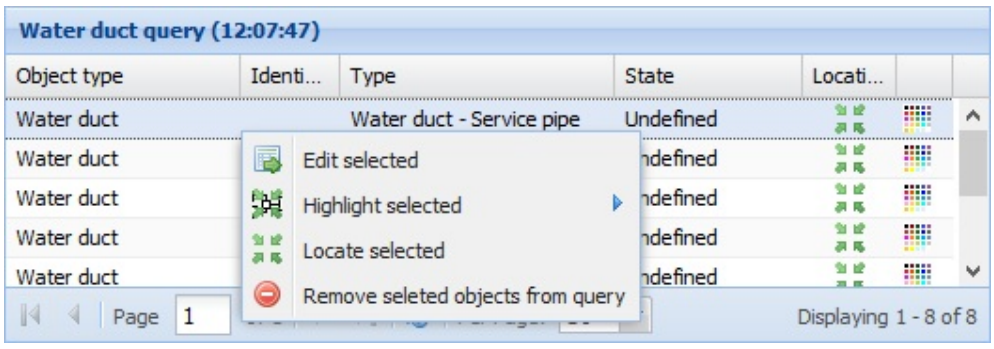
b) In the sub-menu, open a single group of search results.

Removing groups

1. Select the group you want to remove.
2. In the context menu, select **Remove selected queries** .

Opening a group's objects on forms and lists

1. Select the objects.
2. In the context menu, select **Edit selected** .



The selected objects are opened on their own forms.

Highlighting individual objects in a group display

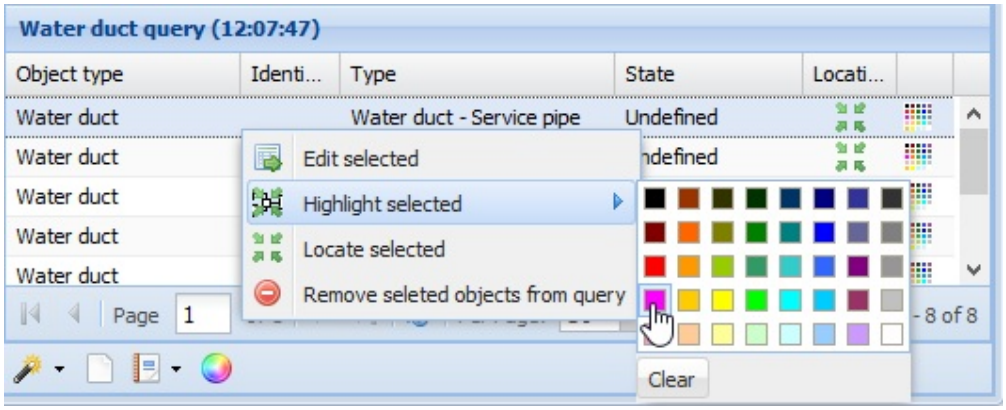
Highlighting options: Select the highlight colour separately for each row, select the same colour for all, or use the default highlight colour.

1. Select the objects you want to highlight

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2. a) In the context menu, select **Highlight selected** to highlight the objects using the default colour, unless you have defined a colour for the row in question.

b) Highlight all selected objects using the same colour by selecting the colour in the sub-menu.



Note! The next time highlighting is applied, the current highlighting is removed. For this reason, if you want to highlight additional objects, you must include the currently highlighted objects in the selection.

Clearing the highlighting of group objects

To clear the highlighting of objects, select **Clear** in the context menu for **Highlight selected**. The highlighting of objects is cleared when you switch to another group or delete objects.

Locating individual objects in a group display

1. Select the objects you want to locate.
2. In the context menu, select **Locate selected queries** (the menu will be displayed when you click the right mouse button on the object list.
3. To locate a single object, click **Locate** in the **Location** column.

Removing an object from a group

1. Select the objects you want to remove.
2. In the context menu, select **Remove selected objects from query** .

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Group reports and exporting a group to an external file format

To create an **Excel** report on the group opened on the object list, click **Reports**. In the drop-down menu, select **Reports** ▸ **Current query to Excel**. A new browser window is opened. The Excel file is handled in accordance with the device and browser settings. Follow the instructions displayed.

In the drop-down menu for **Reports**, select **Export** ▸ **Export current query to...** to export the current group to an external file format. This opens the **Export settings** dialogue box. Instructions are available in the chapter Exporting objects to external file formats (the Export function).

Creating user themes

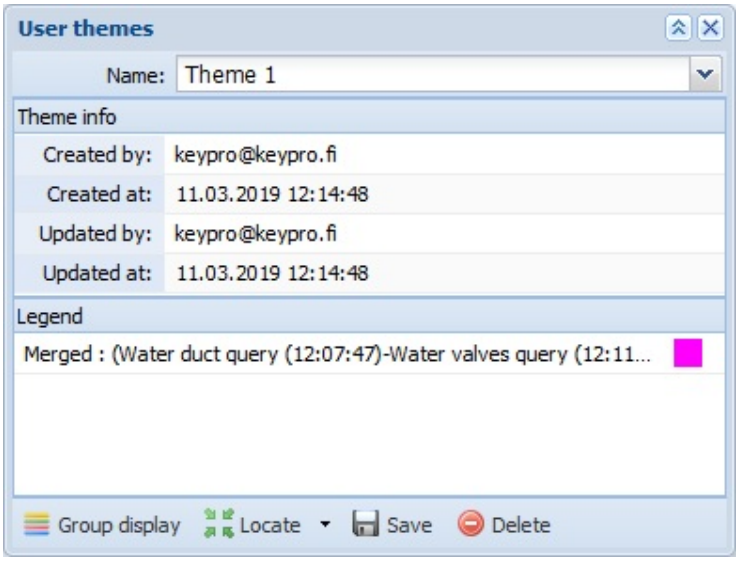
1. Create object groups in the **Group display** . For more information, see the chapter Creating groups.
2. Select the highlight colour for each group.
3. Click **Save as new theme** .
4. In the dialogue box that is displayed, enter a **name** for the theme and click **OK**.

More information on user themes is provided in the chapter User themes.

User themes

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Open the **User themes** form by clicking theme in the toolbar at the top. First, plan the highlighting applied to the group display and save it as a **User theme** for later use (see the chapter Creating user themes).



Viewing user themes

Open the **User themes** form by clicking **User themes** in the toolbar.

1. In the **Name** menu, select the theme you created using the group display.
2. Click **Locate** and **Highlight** to view the selected theme. The map is then centered on the theme and objects are highlighted using the selected colours.
3. To view the content of the theme, click **Group list** . In the group list, select the group whose content you want to view in more detail.

The functions of the Group display are described in the chapter Group display.

Editing user themes

1. On the **User themes** form, on the list in the **Name** field, select the theme you want to edit.
2. To change the highlight colour, click the **Highlight colour** icon and select the colour you want to use.
3. Click **Save** to save the changes.

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TIP: Change the contents of the theme by updating groups in the Group display and by saving the User theme again with the same name. The functions of the Group display are described in the chapter Group display.

Deleting user themes

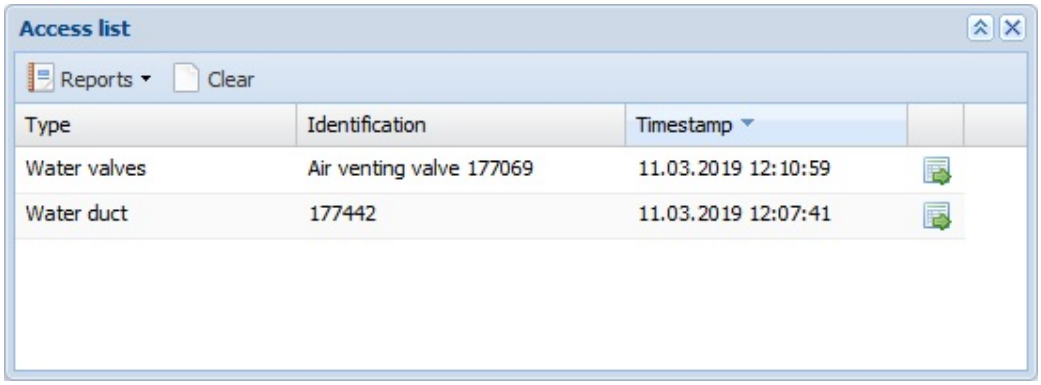
1. On the User themes form, on the list in the Name field, select the theme you want to delete.
2. Click delete **Delete** . You will be asked to confirm the deletion of the theme. Click **Yes** to delete the theme.

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ACCESS LIST

The **Access list** function keeps a record of the forms that were opened during a session and the objects retrieved to the forms. This makes it easier to return to the objects. Select a row on the list and click **Open** to open the object form.

On the Access list, you can view the type and identification of objects and the time when a specific object was handled.



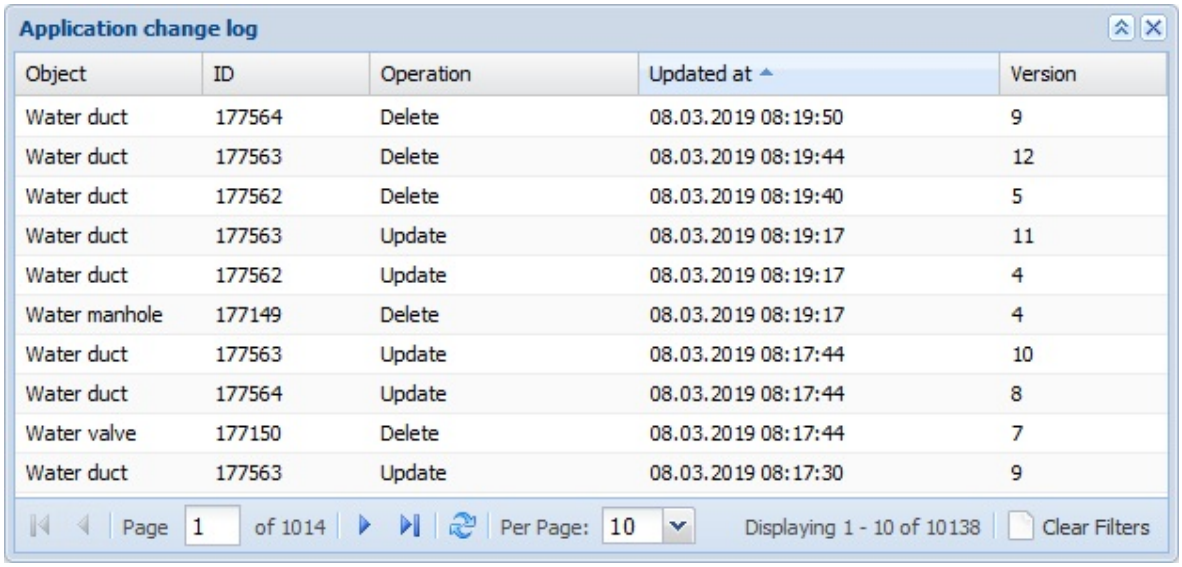
TIP: If you have deleted an object, you cannot retrieve it to an object form by clicking the Open button. Instead, use the Global change list function.

You can create an Excel report on the access list information by selecting **History report** in the drop-down menu for **Reports** . Click **Clear** to clear the access list. The **Access list** is automatically cleared when you log out from **KeyAqua**.

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GLOBAL CHANGE HISTORY

To view the global change history, click **Global change history** . The **Global change history** function lists all saved changes starting from the most recent one. Click a column header to sort the list, or select the sorting order in the menu for a column. View the current version of an object by clicking **Open form** in the menu that is displayed when you click the right mouse button.



Viewing the changes made to an object

In the context menu, click **Open complete change log** to view the full change history of an object. The **Change history** form is displayed with the row in question pre-selected.

Restoring changes

To restore changes, take the following steps:

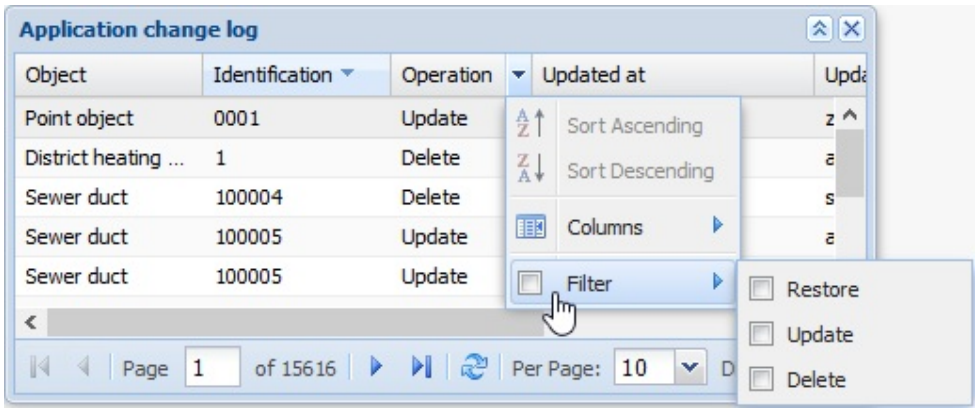
1. On the list, select the changes you want to restore.
2. Click the right mouse button and select **Restore selected changes** .
3. In the summary that is displayed, check that the restoration was successful.

Note! If you selected more than one version of the same object, only the most recent version is restored.

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Using filters

You can filter the changes displayed on the **Global change history** list by activating the required filters in the drop-down menu for a column header. When filters are activated, the related column headers are marked in ***bold and italics***.



Clear a filter by deselecting it in the drop-down menu for a column header or click **Clear filters** at the bottom of the form. This clears all filters.

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MANAGING DEFAULTS

Default values can be defined for most objects, and users can use these values as the basis for creating a new object. See Default form values.

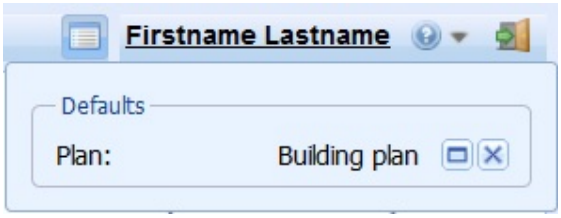
Managing settings defined by an admin user

Admin users can save default values for an object by clicking **Save as default** in the menu for **Save** . The defaults are then available to all users. The **Save as default** function is only displayed for admin users, and it is active when a form has been cleared or an unsaved object is open on the form.

Managing settings defined by a user

On the **Plan** form, you can define the object in question as the default for the duration of the session. Click to do this. After this, in addition to other default settings, the **Plan** field will be filled in on various forms, when you click **Defaults** . Refer to the section Set as default plan for more information.

The defined defaults are displayed in the **Defaults** dialogue box in the top-right corner of the screen.



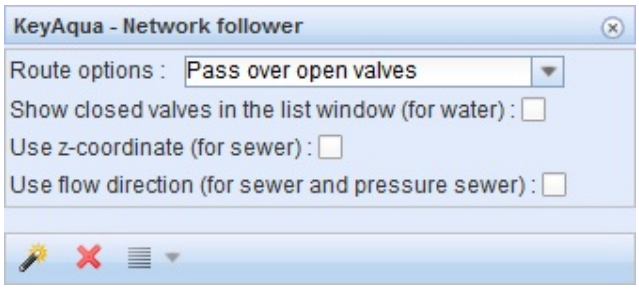
Click **Show on the form** to **open** the default object on its own form. Click to **remove** the default setting.

TIP: If there is no **Defaults** button in the top-right corner, the user has no active default settings.

NETWORK FOLLOWER

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The **Network follower** tool can be found in the **KeyAqua** tools. This function lets you follow a **water and sewer network**, its connections, and elevation data (in sewage and rainwater networks). Network following requires ducts and nodes to be connected to each other in **KeyAqua**. On the form, use **route options** to specify the direction of following and whether the network will be followed across open valves or not.



Route options: Continue over open valves

Following will continue over the valve if its **status is not Closed**. The network will be followed across the open valves for as long as possible.

Route options: Stop on valve

Following will end at the first valve that is found. When following in both directions, following will end at the first valve found in each direction. The network section between the valves will be highlighted on the map.

Show closed valves in the list window (for water):

When network following ends, a list of all closed valves for which following ended will be displayed.

Use z-coordinate (for sewer):

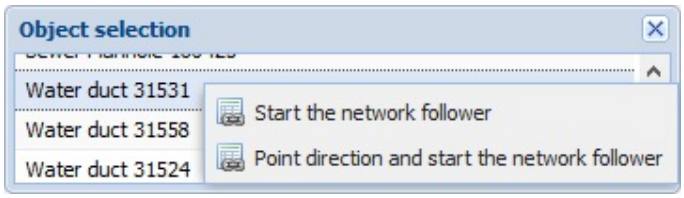
The network will be followed downhill using the duct route and in accordance with the sewer duct's z-coordinates. This option is not available for water ducts.

Use flow direction (for sewer and pressure sewer):

The network will be followed downhill along a sewer or pressure sewer duct in accordance with the flow direction settings. The flow direction for ducts can be defined to be different from the elevation-based flow direction.

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Network following is started from either a node or a duct. The network object from which following will be started is selected with the **Network follower** function. Select the duct or valve you want by defining an area on the map with the left mouse button. A list of the found objects will be displayed. To start following, place the mouser cursor on the selected object, click the right mouse button, and select **Start the network follower**. The network will then be followed in both directions. If you select a water duct, you can indicate the direction in which the network will be followed on the map. To do this, click **Point direction and start the network follower**. The followed network will be highlighted on the map. To stop following, click **Remove map layer** or close the **Network follower** form.



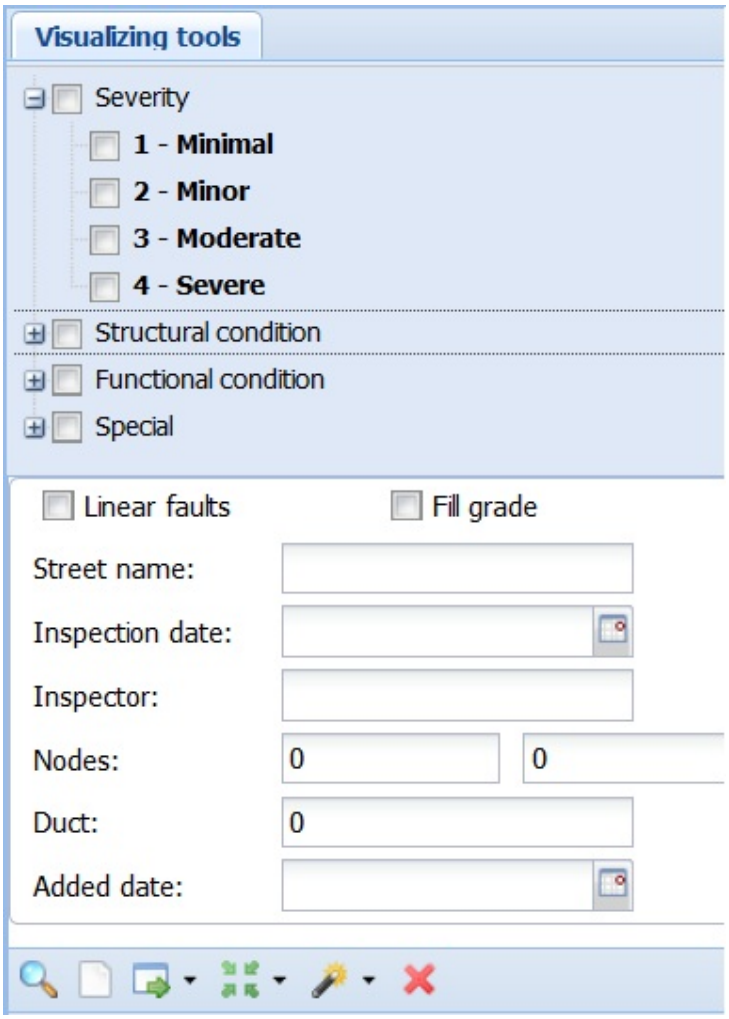
For water ducts, you can either choose to follow in both directions or indicate the direction in which the network will be followed.

The results for network following can be listed or shown in a group display, through which you can, for example, select the consumer points affected by an interruption in water supply and send an SMS to the customers. To use these functions, click **List** or its drop-down menu.

CCTV

The CCTV form is used to define the CCTV results that are displayed on the map. The **CCTV** results imported in the system can be visualized on the map with the **CCTV** function in the **KeyAqua** tools. On the CCTV form, select the **severity levels** that you want to visualize. In addition, select the required **structural and functional conditions** and **special observations**. To include all severity categories, select the **Severity** checkbox. Descriptions can be searched, for example, by street name, inspection date, or inspector.

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Click **Show** to center the map on items that meet the street name and/or inspection date criteria. If these have not been specified, the software will retrieve CCTV data from the displayed area. Click **Clear** to clear the selections you have made, and any objects visualized on the map. You will then be able to make new selections.

The required objects of CCTV inspections will be visualized on the map as text and color. The number in front of the text and the colour of the text indicate the severity level: light green indicates severity level 1 (minimal defect), whereas red indicates severity level 4 (severe defect).

Illustrating objects:

1. At the top of the form, select the severity levels whose defects you want to illustrate on the map.
2. Choose which type of defects or special observations you want to illustrate. If you want to include all severity levels, you don't have to select each one separately, but by selecting Severity checkbox, all will be selected.

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The fields at the bottom of the form can be used as search factors when searching for information of inspection. The inspection can be searched for example by street name, the inspection date or inspector's name. If you search by the name of the street, for example, all inspections are searched for which the name of the street in question is given as the target name. In this case, you can find several inspections made at different times. The inspection can be identified by the name of the street and the inspection date.

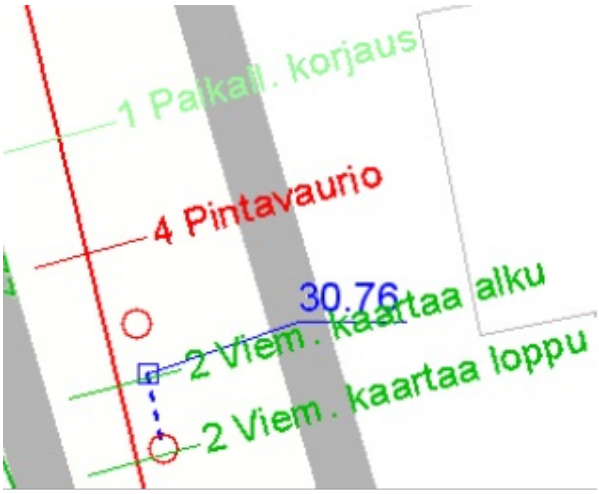
Searching inspection info

The search for CCTV inspection data is started from the **Search** button at the bottom left of the toolbar.

When you search for CCTV inspection information by street name, inspection date or inspector's (researcher) name, the search result will be the manhole of the CCTV inspection in question on the form. Form can be cleared with the **Clear** button located in the toolbar.

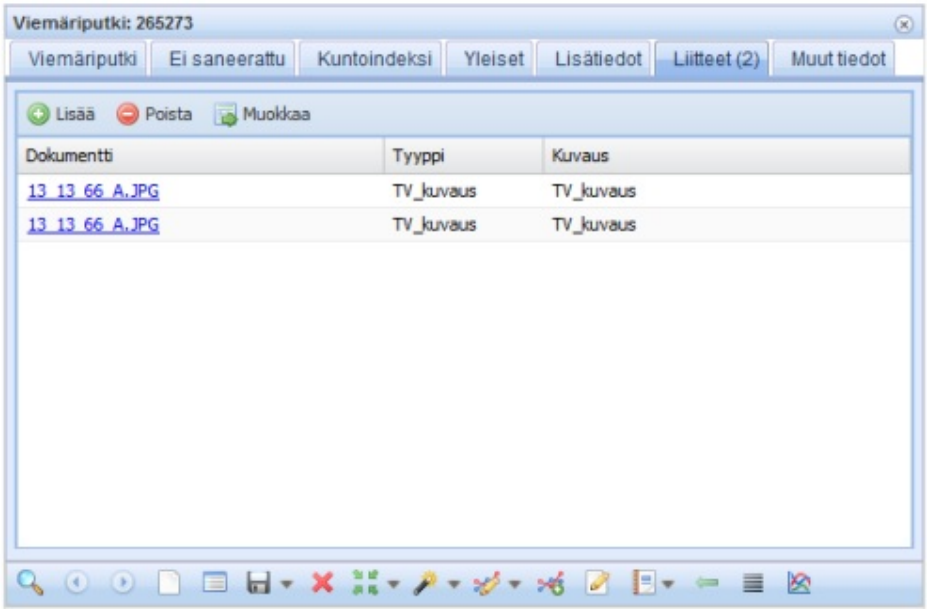
1. Click **Show** to center the map on objects that meet the street name and/or inspection date criteria. If these have not been specified, the software will retrieve CCTV data from the displayed area. The **Show all** button, which is activated from the drop-down menu of the **Show** button, illustrates all observations obtained in the search.
2. With the **Locate** function and the **Locate all** function found behind the drop-down menu, the map is centered either on a single manhole or on the entire searched inspection.
3. With the **Clear** button, both the selections made and possibly the objects illustrated on the map are lost, allowing new selections to be made.
4. The desired objects of CCTV are illustrated on the map with text. The number in front of the text and the color of the text indicate the degree of severity: light green reflects severity level 1 (minimal fault), red indicates severity 4 (severe fault).

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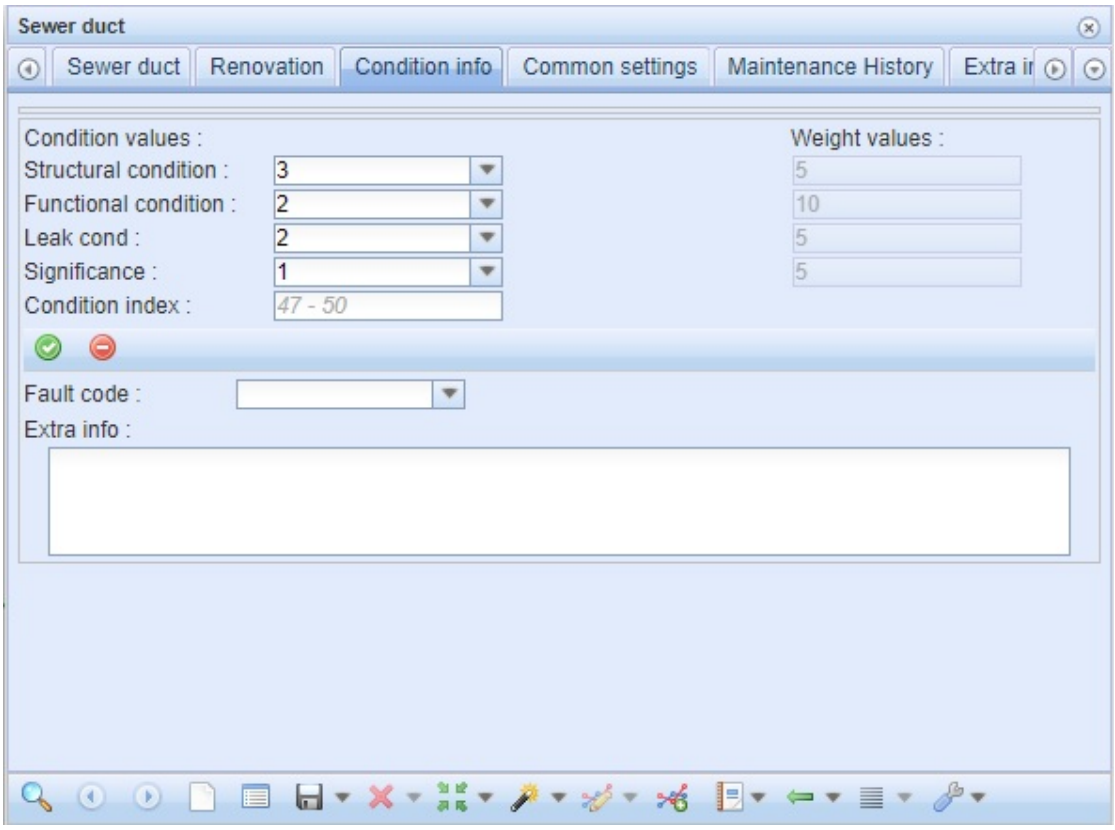
Tabs related to CCTV on forms

For example, on the **Attachments** tab of the **Sewer duct** form, you can upload still images related to CCTV inspections.



You can also document three additional condition values from the **Condition info tab** which are **Structural condition, Functional condition, Leak cond.** Necessary information must be given to these fields for the calculation of the **Condition index** by the system. The CCTV functionality must be activated on the form.

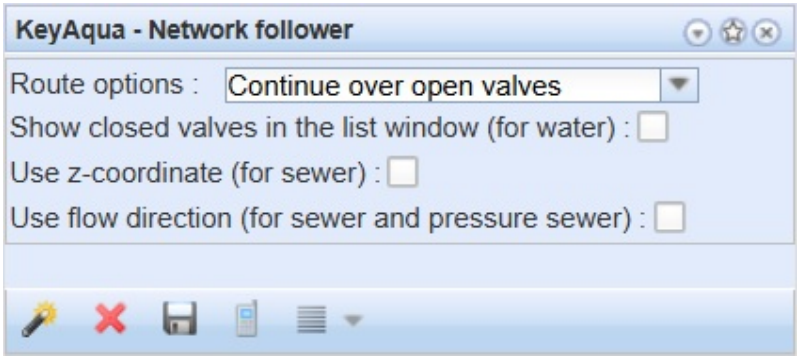
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NETWORK FOLLOWER

The **Network follower** tool can be found in the **KeyAqua** tools. This function lets you follow a **water and sewer network**, its connections, and elevation data (in sewage and rainwater networks). Network following requires ducts and nodes to be connected to each other in **KeyAqua**. On the form, use **route options** to specify the direction of following and whether the network will be followed across open valves or not.



Route options:

- **Continue over open valves:** Following will continue over the valve if its **Status** is not **Closed**. The network will be followed across the open valves for as long as possible.
- **Stop on valve:** Following will end at the first valve that is found. When following in both directions, following will end at the first valve found in each direction. The network section between the valves will be highlighted on the map. By clicking **Save valve closure** you can save the list of valves to be closed.

Show closed valves in the list window (for water): When network following ends, a list of all closed valves for which following ended will be displayed.

Use z-coordinate (for sewer): The network will be followed downhill using the duct route and in accordance with the sewer duct's z-coordinates. This option is not available for water ducts.

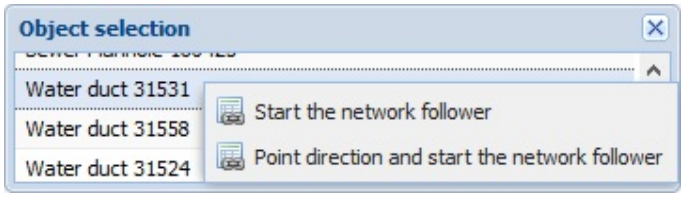
Use flow direction (for sewer and pressure sewer): The network will be followed downhill along a sewer or pressure sewer duct in accordance with the flow direction settings. The flow direction for ducts can be defined to be different from the elevation-based flow direction.

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SMS Sending: Clicking the button opens an **SMS** form pre-filled with the list of affected addresses.

Starting the network following

Network following is started from either a node or a duct. The network object from which following will be started is selected with the **Network follower** function. Select the duct or valve you want by defining an area on the map with the left mouse button. A list of the found objects will be displayed. To start following, place the mouser cursor on the selected object, click the right mouse button, and select **Start the network follower**. The network will then be followed in both directions. If you select a water duct, you can indicate the direction in which the network will be followed on the map. To do this, click **Point direction and start the network follower**. The followed network will be highlighted on the map. To stop following, click **Remove map layer** or close the **Network follower** form.

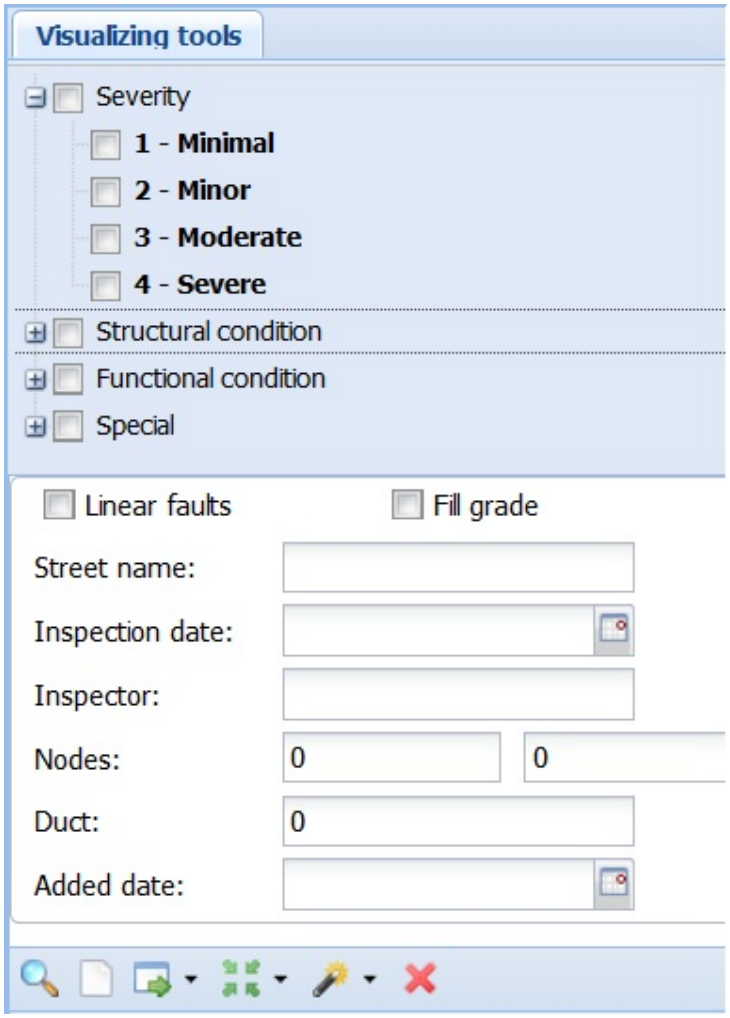


The results for network following can be listed or shown in a group display, through which you can, for example, select the consumer points affected by an interruption in water supply and send an SMS to the customers. To use these functions, click **List** or its drop-down menu.

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CCTV

The CCTV form is used to define the CCTV results that are displayed on the map. The **CCTV** results imported in the system can be visualized on the map with the **CCTV** function in the **KeyAqua** tools. On the CCTV form, select the **severity levels** that you want to visualize. In addition, select the required **structural and functional conditions** and **special observations**. To include all severity categories, select the **Severity** checkbox. Descriptions can be searched, for example, by street name, inspection date, or inspector.



Click **Show** to center the map on items that meet the street name and/or inspection date criteria. If these have not been specified, the software will retrieve CCTV data from the displayed area. Click **Clear** to clear the selections you have made, and any objects visualized on the map. You will then be able to make new selections.

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The required objects of CCTV inspections will be visualized on the map as text and color. The number in front of the text and the colour of the text indicate the severity level: light green indicates severity level 1 (minimal defect), whereas red indicates severity level 4 (severe defect).

Illustrating objects:

1. At the top of the form, select the severity levels whose defects you want to illustrate on the map.
2. Choose which type of defects or special observations you want to illustrate. If you want to include all severity levels, you don't have to select each one separately, but by selecting Severity checkbox, all will be selected.

The fields at the bottom of the form can be used as search factors when searching for information of inspection. The inspection can be searched for example by street name, the inspection date or inspector’s name. If you search by the name of the street, for example, all inspections are searched for which the name of the street in question is given as the target name. In this case, you can find several inspections made at different times. The inspection can be identified by the name of the street and the inspection date.

Searching inspection info

The search for CCTV inspection data is started from the **Search** button at the bottom left of the toolbar.

When you search for CCTV inspection information by street name, inspection date or inspector’s (researcher) name, the search result will be the manhole of the CCTV inspection in question on the form. Form can be cleared with the **Clear** button located in the toolbar.

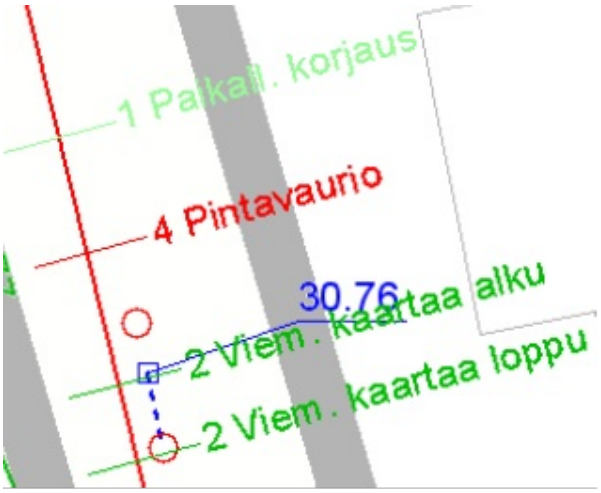
Click **Show** to center the map on objects that meet the street name and/or inspection date criteria. If these have not been specified, the software will retrieve CCTV data from the displayed area. The **Show all** button, which is activated from the drop-down menu of the **Show** button, illustrates all observations obtained in the search.

With the **Locate** function and the **Locate all** function found behind the drop-down menu, the map is centered either on a single manhole or on the entire searched inspection.

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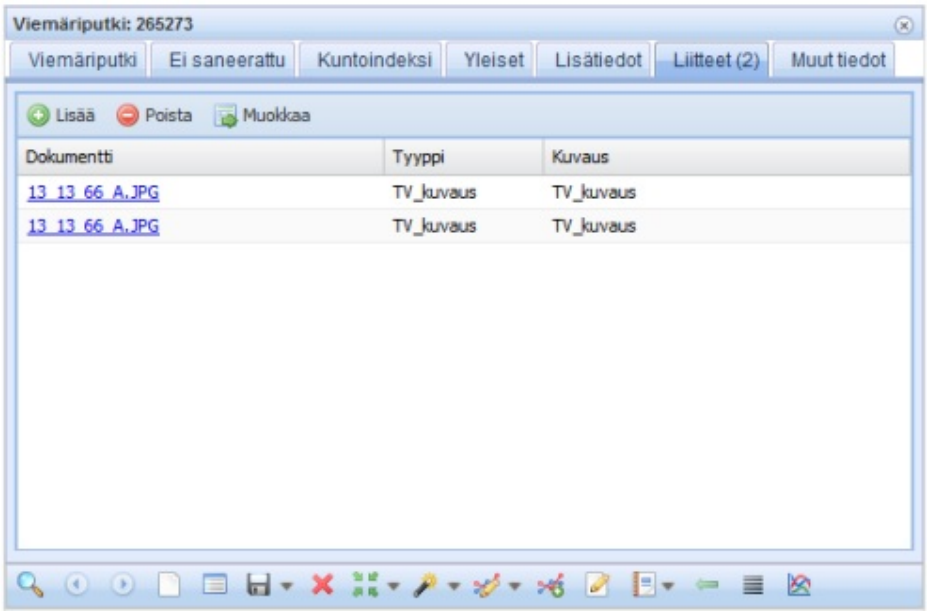
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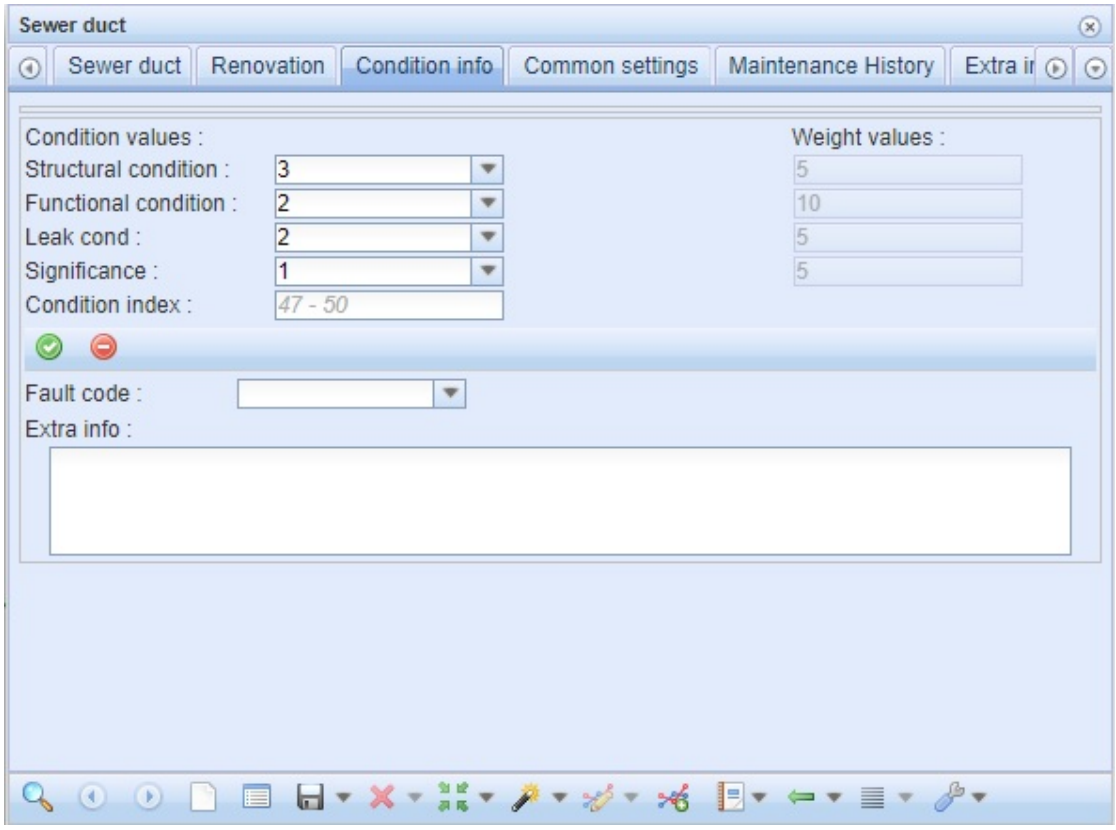
Tabs related to CCTV on forms

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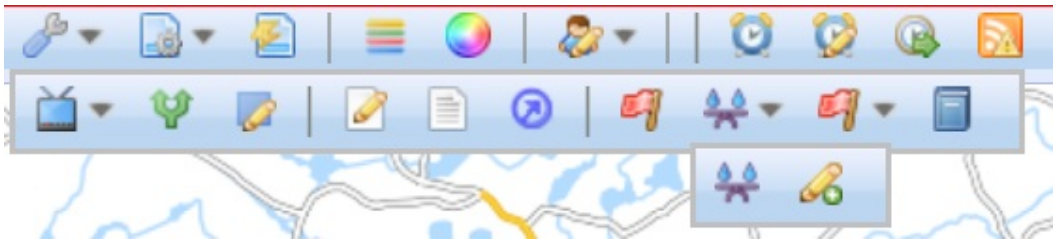


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WATER BALANCE CALCULATION (this function is subject to a separate order)

The **Water balance calculation** form can be found in the **KeyAqua** tools. The function can be used to monitor the flow of water and sewerage water through areas. The tool requires all areas to be interconnected by meters in KeyAqua to determine the hourly discharge and inlet volumes of water and wastewater.

The **Water balance calculation** form also provides information on daily rainfall from the Finnish Meteorological Institute, which can be viewed on the form and illustrated on the map.



Preparations before using the tool

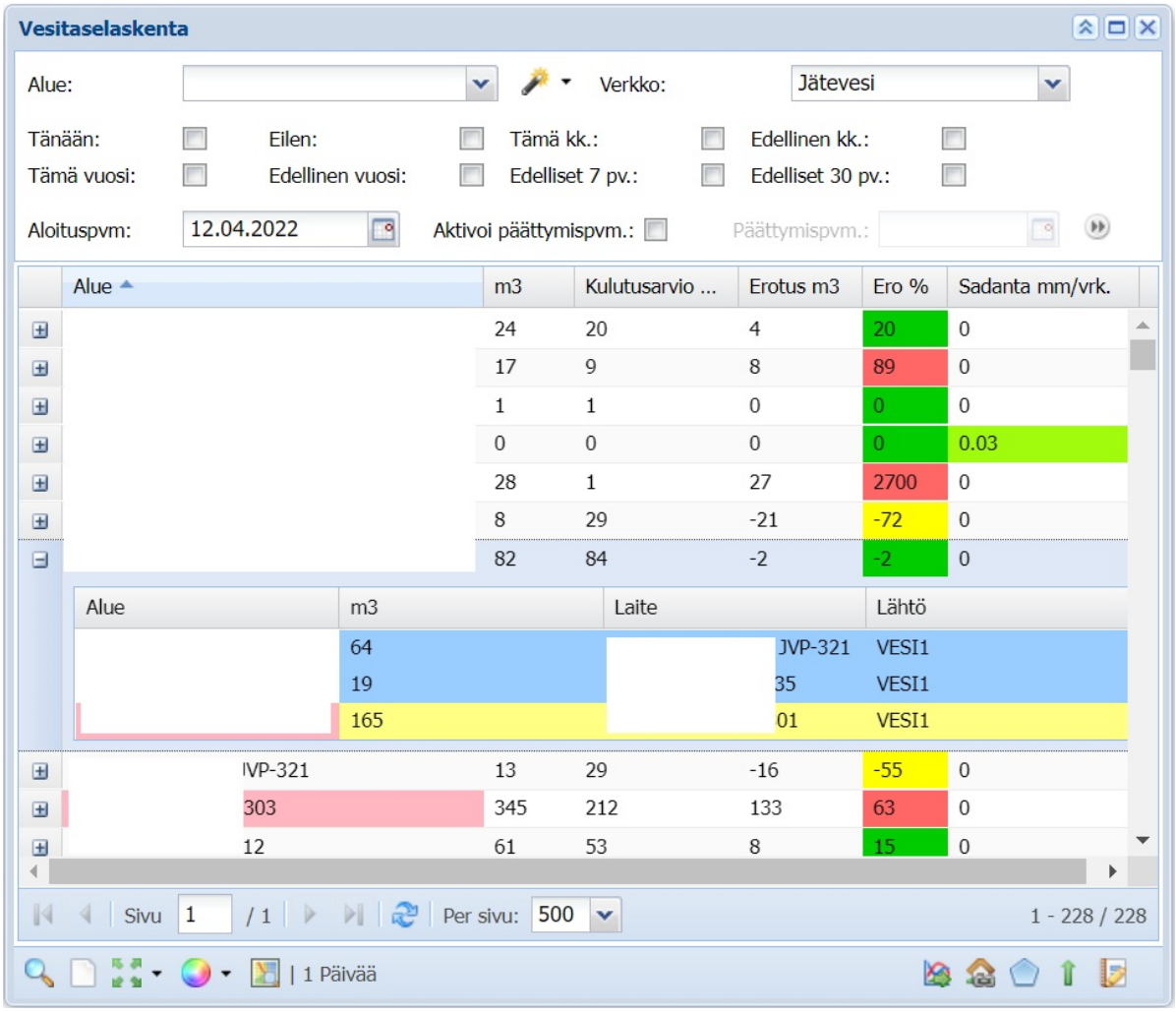
The implementation of the **Water balance calculation** tool requires the following preparations:

1. **Interface**: Requires a client management system for water consumption data. Also, AquaRex or an equivalent product is required for pumping station flow data.
2. **Data analysis and quality improvement project:** To ensure that KeyAqua network quality is at the required level.
3. **Planning**: Pumping station areas are created using the **Area** tool. The area cropping is made according to the wastewater sewer network. The consumer points from which wastewater is discharged into the pumping station area are designated inside of this area.
4. **Commissioning work**: Setting locations for pumping stations both manually and automatically is defined on a customer-by-customer basis.

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Water balance calculation form

The **Water balance calculation** form can be divided into two sections. They are the **Search** section and the **Search results** section. The use of buttons common to both forms is discussed in the chapter GENERAL FUNCTIONS OF THE OBJECT FORMS.



Searching information

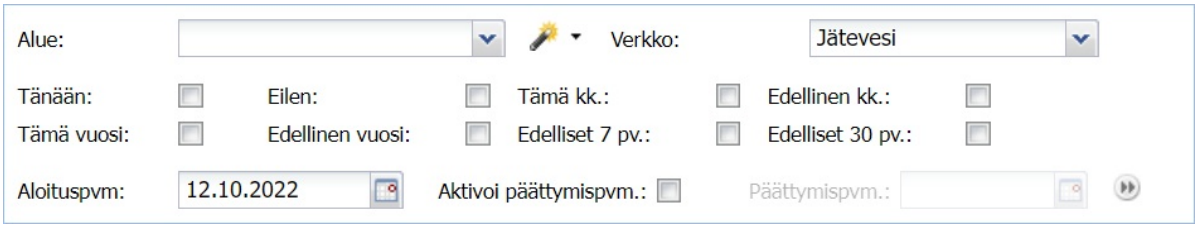
The search criteria fields are in the upper part of the form. The system will automatically select the preferred network from the **Network** drop-down menu.

1. Start the search by selecting the area you want from the **Area** menu and the network you want from the **Network** menu. If you don't select an area, the system retrieves information from all areas.
2. Tiedon haku osion keskiosasta voidaan määrittää aikaväli hakutuloksille valintaruutu-pikanäppäimillä. Klikkaamalla yhtä

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valintaruutu-laatikkoa, asetat automaattisesti hakutulokselle aloitus- ja päättymispäivät, jotka voi määrittää myös manuaalisesti klikkaamalla **Aloituspvm** ja **Päättymispvm**. Mikäli haluat tehdä haun manuaalisesti, aktivoi **Päättymispvm**-kenttä ensin **Aktivoi päättymispvm**-valintaruudusta. In the middle part of the search section, you can set a time interval for the search results by clicking the boxes. By clicking one of the checkboxes, you automatically set the start and end dates for the search result, which can also be set manually by clicking **Start date** and **End date**. If you want to do the search manually, activate the **End date** field first from the **Activate end date** check box.

3. Finally, press the **Update grid** button on the form's toolbar to perform a search using the criteria you entered. The results appear in the middle part of the **Water balance calculation** form.



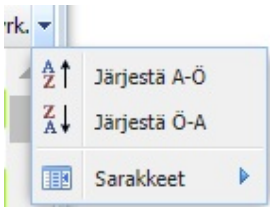
The grid and search results

Oletus sarakkeet ja niiden merkitys:

- **Area**: Name of the area
- **m3**: The amount of sewage pumped from the area (sewer), or water consumed in the area (clean water) in cubic meters (m3)
- **The consumption estimates m3**: Estimated amount of consumption/sewage for the selected timespan.
- **Flow difference m3**: The difference between the actual flow and the estimate in cubic meters
- **Flow difference %**: The difference between the actual flow and the estimate in procentage
- **Precipitation millimeters per day in the timespan**: The projected daily rain in millimeters (if the user has precipitation option activated)

Activate more columns by clicking **Columns** from the drop-down menu.

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The flow data of the Area

To get more detailed information about flows, click on the + symbol on the left of the name of the area. From the drop-down menu, you can view coming and going flows. The areas from which the flow comes are shown in blue fields. The yellow field, on the other hand, shows where water/wastewater has flowed from the selected area.



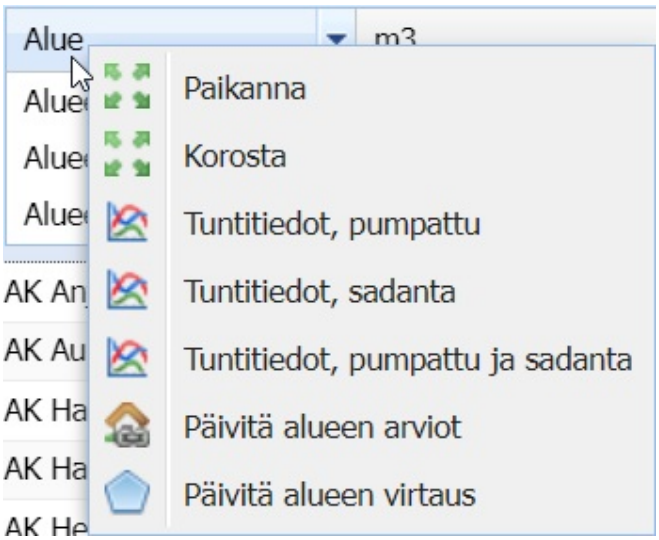
Note! The difference between all the received sewage and the pumped sewage is the amount of sewage produced in the area in that timespan.

The functions of the context menu on the Water balance calculation form

Avaa kontekstivalikon toiminnot klikkaamalla saraketta hiiren oikealla painikkeella:

- **Paikanna**: Paikantaa ja korostaa valitun alueen verkkokartalla
- **Korosta**: Ainoastaan korostaa valitun alueen verkkokartalla
- **Tuntitiedot, pumpattu**: Näyttää tuntitiedot pumpatusta vedestä/viemärivedestä viivakaaviona
- **Tuntitiedot, sadanta**: Näyttää tuntitiedot kerätystä sadevedestä viivakaaviona
- **Tuntitiedot, pumpattu ja sadanta**: Näyttää tuntitiedot pumpatusta vedestä/viemärivedestä ja kerätystä sadevedestä viivakaaviona.
- **Päivitä alueen arviot**: Päivittää alueen kulutusarviot
- **Päivitä alueen virtaus**: Päivittää arviot alueen virtauksesta

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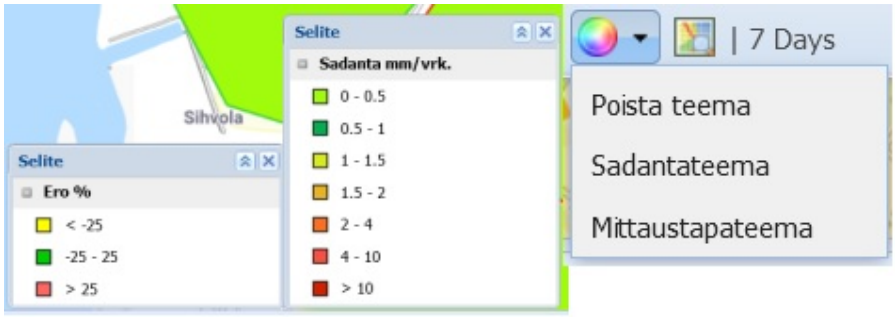
Huom! Voit paikantaa haluamasi alueen nopeasti verkkokartalle kaksoisklikkaamalla sitä taulukosta.

Themes of the Water balance calculation form

You can manage the themes of the searched areas with **Themes** tool. The existing themes of the area are automatically activated when the search is performed.

By clicking on the **Themes** symbol, the colors appear on the map according to the values of the **Flow difference %** field. By clicking on the arrow next to the tool, you open a drop-down menu from which you can remove the theme and open the precipitation and measurement method themes on the map.

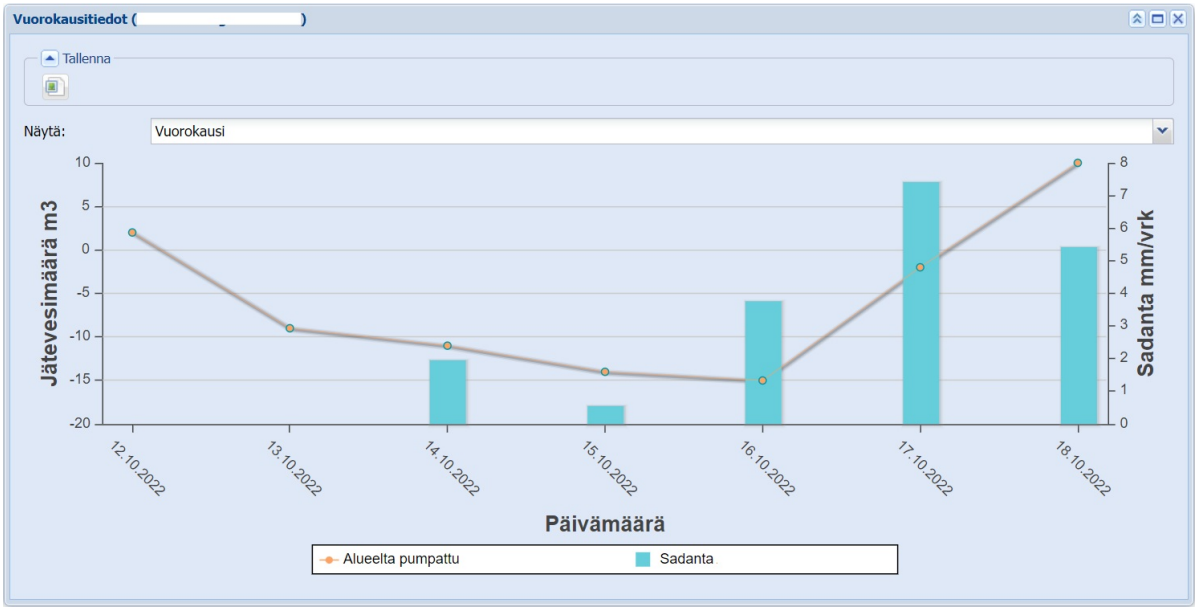
When activating a theme, the corresponding **Legend** window will appear on the map. In the **Precipitation** theme's explanation, the information is obtained from the **Precipitation mm/day** field of the table, while in the **Measurement theme**, different measurement methods are illustrated on the map, which are specified in the **Device** form.



Apply to the chart

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You can open the data of the certain searched time period on a line chart when you only have selected a single area. Click the **Search to diagram** button from the toolbar of the **Water balance calculation** form to open the **Daily information** form. From the **Show** drop-down menu, you can select the time from which the line graph will illustrate the data. You can also save the chart as an image with the **Save** button on the top left of the form.

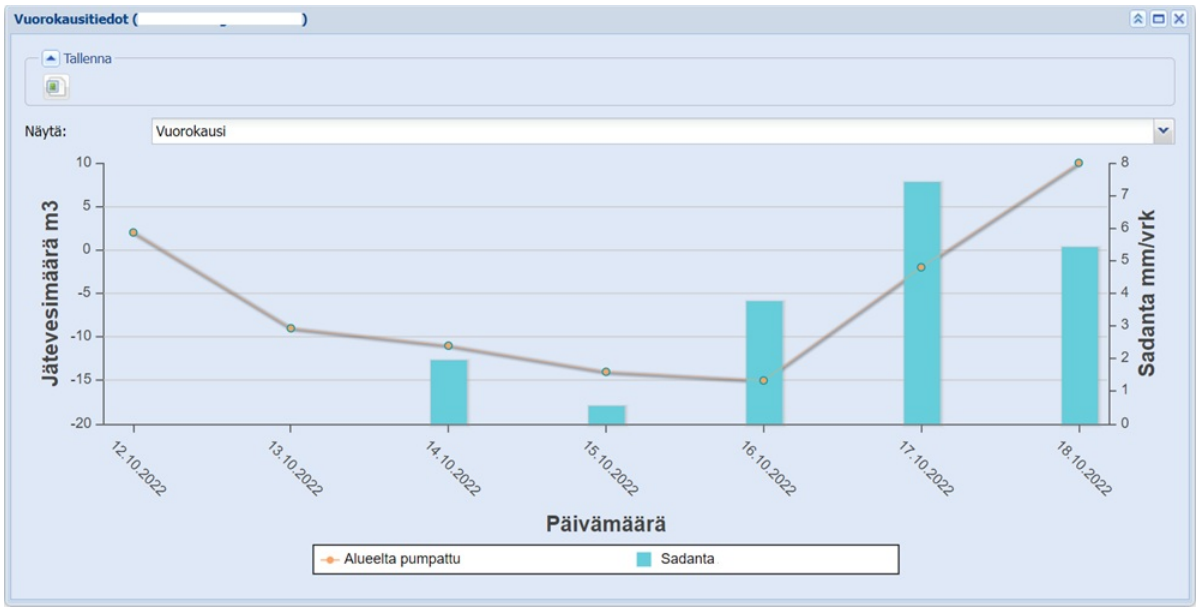


Comparison panel

The user can compare two different search results at the same time with two different water balance calculation forms:

1. To open the comparison panel, click the **Compare** button at the bottom right of the data search section. The form opens a new panel with the same search results next to the original form.
2. After this, a new search with new search criteria can be performed on one of the forms. If only one **Area** row is selected on both forms, you can open both panels to be compared simultaneously as a line chart on the **Daily Information** form.

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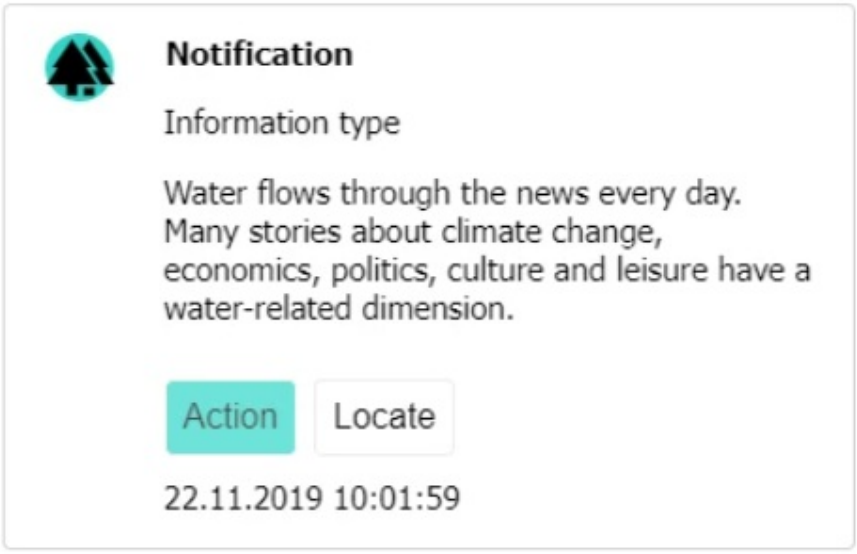
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NOTIFICATIONS

Notifications tool is for showing alerts and other urgent or relevant information as popup messages in the user interface.

When the tool is activated and the user belongs to the user group called POPUP_MESSAGE_USER, application will be polling the table for new messages for the user and open them in the lower right corner of the **Map view**.

The image below explains the received information in the shown message:

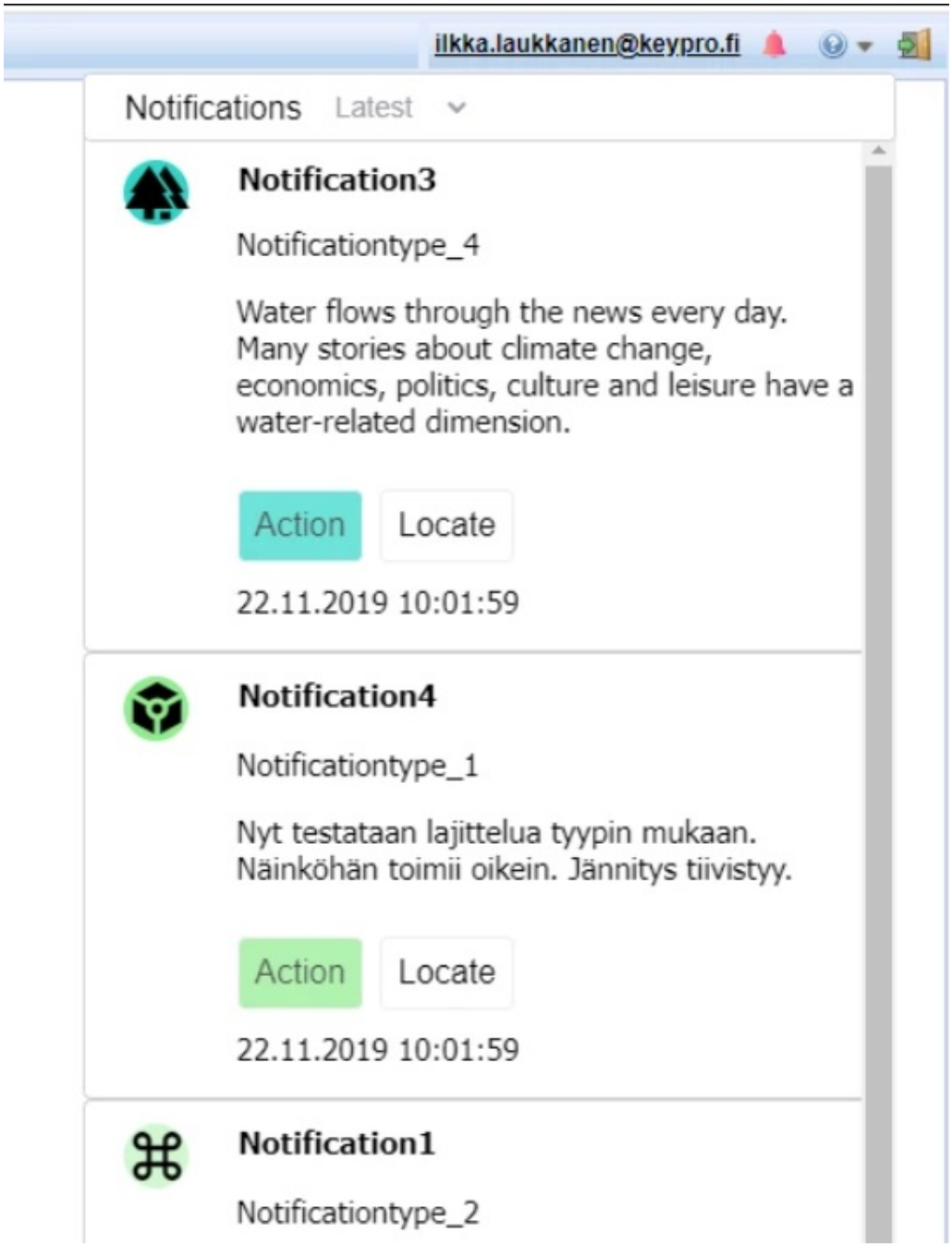


- **Message**: The actual message and the type of the message
- **Title**: Shown bolded at the top of the message.
- **Action**: The follow up action that is performed when the 'Action' -button is pressed.
- **Locate**: The location where the event of the notification took place.
- **Time stamp**: The time when the event of the notification took place.
- **Icon**: The icon at the upper left corner comes from Google fonts material icons.

Notifications center

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To start browsing the notifications, open the **Notifications center** by clicking the **Notifications** button from the toolbar. It will as default show the four latest messages. If you scroll all the way down to the bottom of the list, four more messages will be fetched, and they appear at the bottom of the list.



Sorting

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At the top part of the center there's a filter dropdown menu. You can filter by **Latest, Severity** and **Type** categories which means you can order the messages in descending chronological order, according to the severity or type. The search is performed when the dropdown is closed. The severities are always between 1-4, but the types are read from the text constants group called POPUP_TYPE_MAPPING where a different order can be determined.



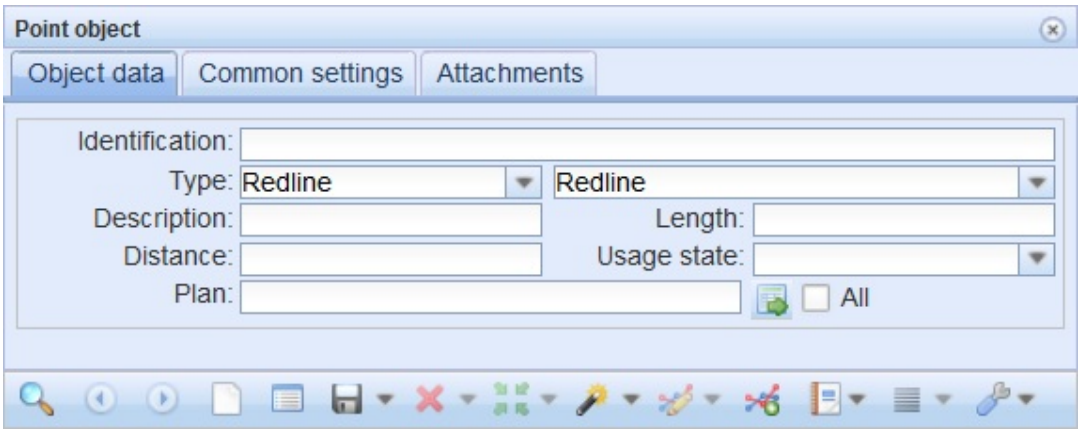
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OTHER TOOLS

This section discusses system features that are not directly related to the other categories.

Point object

Point objects are objects independent of the networks, such as traffic signs. The **Point object** tool can be found in the toolbar at the top of the map view. You can add items freely on a map using the **Create** function.

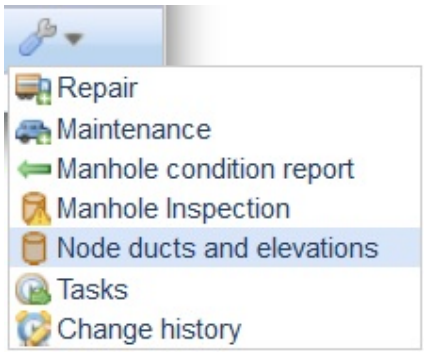


Node ducts and elevation

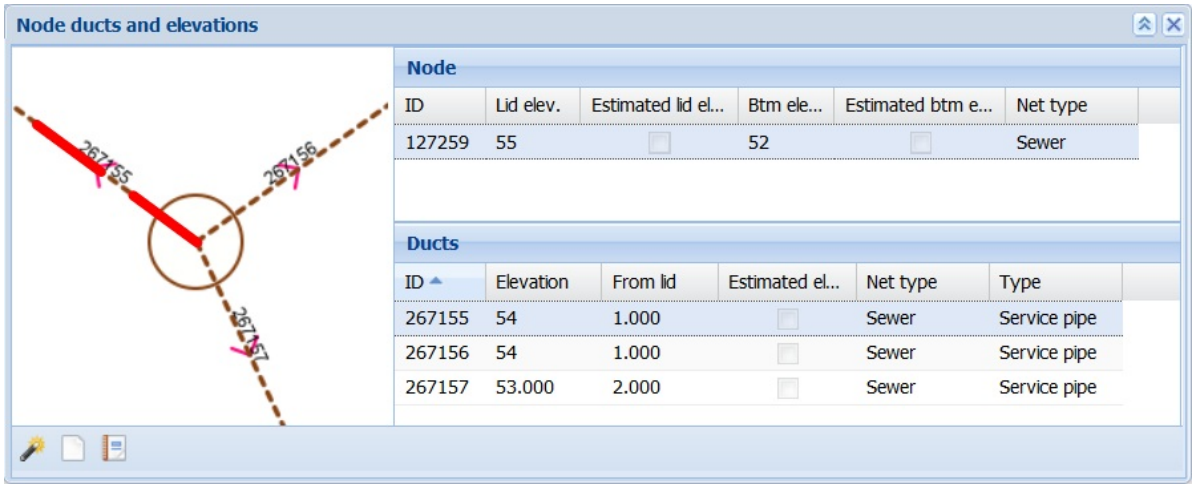
The **Node ducts and elevations** form is used to view and update the elevation data for the selected node and the ducts connected to it. In the case of a sewer network node, you can create a printout called a **Manhole survey card**. The manhole survey card is used to display the data content and connections of the node and the ducts connected to it. To retrieve a node to the form, use the **Pick** tool and define the required object on the map. If the area you define includes several nodes, a list of nodes will be displayed, and you can choose the node that you want.

You can open the **Node ducts and elevations** form from the drop-down menu for Common in the toolbar at the top of the map view or from the menu for **Other tools** on the **Sewer nodes** form.

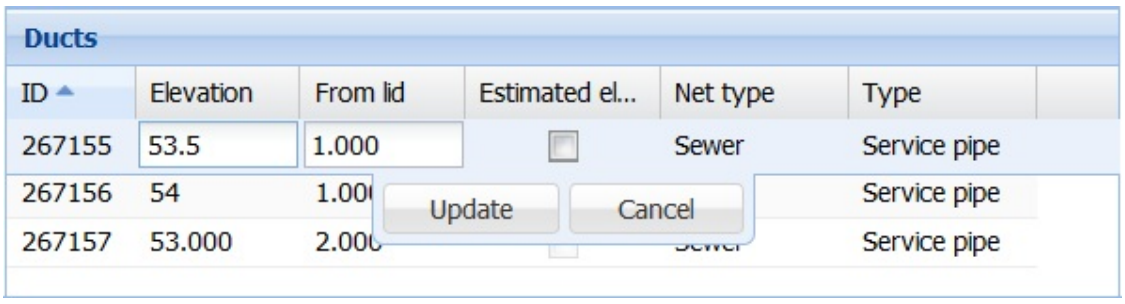
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The **Node ducts and elevations** form consists of three sections: the **Map window** and the **Node** and **Ducts** tables. The directions of the ducts connected to the node and the names of the ducts are displayed in the **Map window**. The **Node** and **Ducts** tables present the property attributes of the objects in question.



You can **edit the elevations of objects connected to the node** by double-clicking the object row. You can then edit the values on the selected line. Click **Update**/**Cancel** to update or cancel the changes you made.

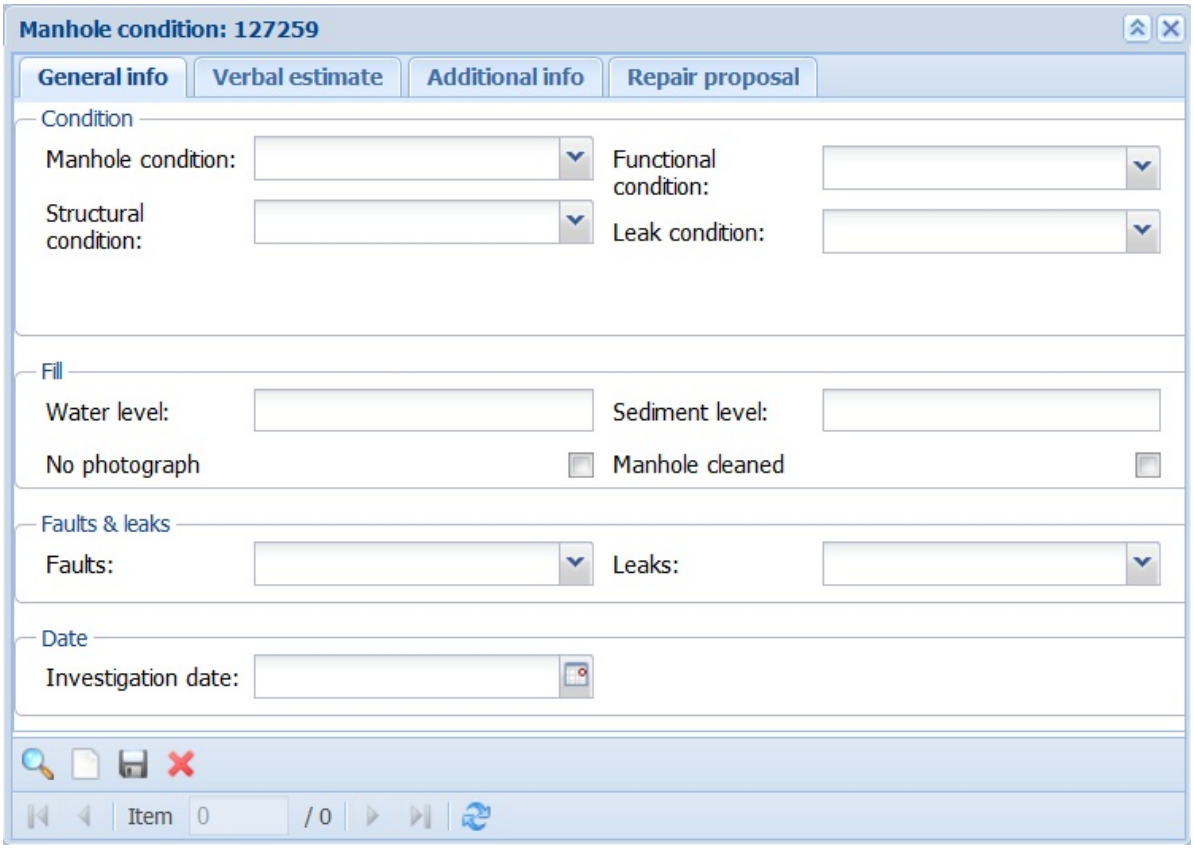


To download and print the Manhole survey card and the condition-related information in **PDF** or **XLSX** format, click **Manhole survey card** . To **hide** ducts from the **Ducts** list on the Manhole survey card, click the duct row with the right mouse button and select **Hide**. The duct will no longer be displayed on the Manhole survey card list and printout, but it will not be removed from the database. The manhole condition form is described in the chapter Manhole condition.

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Manhole condition report

The **Manhole condition report** form can be opened from the **Other tools** menu at the bottom of the **Sewer manhole** form. To add a condition report, click **Add condition** .



In addition to general data, you can also save comments, additional information, or repair suggestions on the **Manhole condition** form. The information saved on the various tabs of the form can be printed on the **Manhole survey card**. You can print it from the **Node ducts and elevation** form (see the section Node ducts and elevation).

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GLOSSARY

Digitizing

Objects are created in electronic format by digitizing them, meaning location information is created on a computer screen.

Geometry

The geometry data of an object means the coordinate points and information on the geometric shape (point, line, area, or a group of such shapes).

Search criterion

A search criterion is an attribute value that is entered on a form or selected in a menu, and then used for searching for a specific object type in the database. There can be one search criterion (such as an address) or several criteria (such as the duct type and construction year).

Map object

An object that can be located on a map, such as a duct, node, icon, event, area, or text.

Field

Reserved space on forms for entering property values, such as an identifier and a comment.

Center the map

When an object is located on the map, it is used as the map center. The map is also zoomed in to the object.

Object layer

Objects on the map view are presented on various layers. For example, sewer and rainwater ducts are displayed at their own levels, and the same applies to quality reclamations and survey items. Object layers can be activated and deactivated as required for various purposes.

Coordinate

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Coordinates indicate an object's location on the earth or in a map coordinate system. Map coordinates are coordinate values, and in a projected coordinate system they are defined as X and Y values, meaning the north and east.

Elevation

For example, the node elevation in metres. A full stop is used as the decimal separator.

Zooming out

Changing the map view so that it covers a larger area. In other words, zooming out changes the map scale so that it is smaller, and the map objects are, therefore, displayed in a smaller size.

Form

Network objects and the related events are created, viewed, and edited on forms. Forms are used for creating an object on the map and for adding property values to the object. There is a separate form for each network object.

Form button

At the bottom of each form, there are buttons for managing the object, and the functions of these buttons are similar on all forms. The buttons can be used, for example, to locate an object, update object data or geometry, and delete an object from the database.

Zooming in

Changing the map view so that it covers a smaller area. In other words, zooming in changes the map scale so that it is larger, and the map objects are, therefore, displayed in a larger size.

Scale

Scale indicates the proportion of the object representation's size to the actual object. Maps are scaled when the objects are too small or large to be presented as life-size.

Default values

Default values are an object's property values that have been defined in the system. They are pre-completed on a form, or they can be restored to a form from the system. Default values defined in the system can include, for example, the most common property values for an object.

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Property value

Property values provide information on an object's properties, such as what the object is or what it is like. The property values of objects can be edited on forms. For example, information on an object's construction year or address can be added.

PDF document

PDF documents can be created for the various events. The documents are opened in a new browser window. These documents can be saved or printed using the browser's printing tools. PDF documents saved on a workstation can be viewed using a program such as Adobe Acrobat Reader.

Point object

Point objects are network objects whose location is defined using one coordinate point. Nodes and events are examples of such objects.

Location information

Location information refers to information on a geographical location that is defined based on coordinates, an address, or other location data (such as an area name). The location of objects can be indicated in various ways. For example, an object has been created on the map, in addition to which its address has been defined.

Event

Events refer to functions that are related to network objects. An event can be a quality reclamation, a state report, a water leak report, or a work program. You can also create location information for events.

Database

A database is a collection of data. Data has been organised so that it can easily be managed and the required information can be found quickly. The data in a database has been organised in a specific logical way, in order to make data retrieval as efficient as possible.

Identifier

Each network object is assigned a unique identifier. Even though objects may have identical property values, they can be identified based on their identifier.

Type

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Network objects are managed on object-specific forms, such as the form for fireplugs or the form for hydrants. More detailed type information can be added to each object's property values. For example, the duct type for a sewer duct can be defined as main duct or scrap duct.

Menu

Reserved space on forms for selecting property values based on pre-defined options. Examples of such information include usage state and material.

Line object

Line objects are network objects whose location is defined using at least two coordinate points. Ducts are one example of such objects.

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