
User's Guide

Surface Manager

Version 2.19



Epiroc

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Introduction

General information

Surface Manager is a tool built for Epiroc surface drill machines reporting and its associated processes. This includes conversion of CSV files into the standard IREDES drill plan for Epiroc surface drill machines and robust export functions.

Surface Manager in its context

Surface Manager may be installed and run either as stand-alone or as a client/server solution to get all the functionality. The client is called Surface Manager and the server is called Surface Manager Server. The system all together is also called Surface Manager.

Surface Manager imports drill plans exported from CAD tools, and exports to the machine compatible IREDES format.

Surface Manager Server parses log files, transferred from Epiroc machines using RRA, and populates a Surface Manager database.

Surface Manager presents log information in a graphical, easily understandable way. Reports may be generated for printing or exported to spreadsheet format. Log information includes near real-time drill status, time usage, drill depth and holes drilled, penetration rate, consumables performance, planned vs drilled model and rock hardness.

The dashboard can be configured to show the information desired.

Surface Manager centralizes management of TUM (Time utilization Model) codes and operator names. Surface Manager may then export them to the entire Surface Manager compatible fleet with a single action.

Surface Manager is configurable to have limited sets of functions, ensuring the user has the required access to drill information and management.

The user

This guide assumes the user has some knowledge of the Windows environment. This applies in particular to the use of the mouse, keyboard and menus.

Installation

System requirements

Installing/using Surface Manager requires the following:

1. A Surface Manager installation package
2. A PC with a 1GHz or faster processor is recommended
3. At least Windows Vista (Windows 10 is recommended).
 - i. *Irrespective of which operating system is used it must be fully updated with the latest service packs and security updates.*
4. At least 1 GB of RAM (2 GB or more is recommended)
5. Free disk space of at least 1 GB
6. Microsoft Excel 2003 or later (for report generation)
7. A PDF reader (for report generation)

Installation

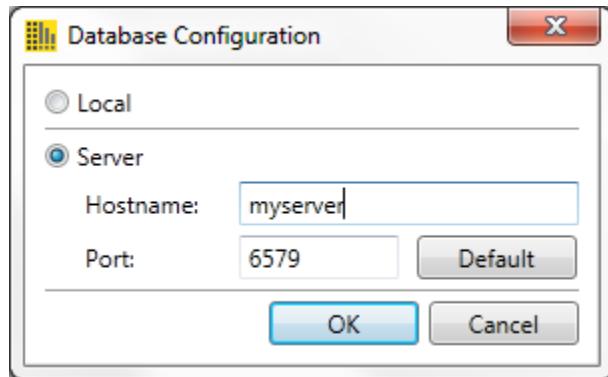
Installing Surface Manager requires administrator privileges for the computer. Install the program by starting the installer **SurfaceManager.exe** available on your installation disc or USB memory stick.

Then follow the instructions in the installation program.

Surface Manager is normally installed to: **C:\Program Files\Epiroc\Surface Manager**. However, this may vary slightly depending on the operating system's language version.

First time configuration

A database configuration dialog is shown the first time Surface Manager is started.



Select *Local* or *Server* database.

Local

Run Surface Manager with a local database on the installed computer. Log files need to be imported manually. The database cannot be shared between multiple computers.

Choose this option if the intended purpose is to run Surface Manager only on this machine.

The local setup is mainly used for testing purposes. For production environments the recommendation is to run Surface Manager with the Server setup.

Server

Run Surface Manager with a Surface Manager Server and server database. Choose this option if user requires centralized data (multiple users), automatic import of the machine's log files, and automatic drill plan export.

Please consult your server administrator for Surface Manager service hostname and port.

Running with Local and Server database, can be set from within Surface Manager. See **Change database**, page 144.

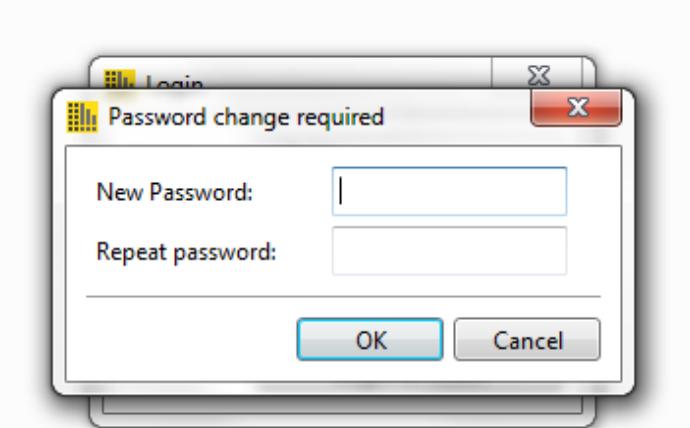
Note: *Log files imported to the local version of Surface Manager will only be seen running local and the other way around for server.*

Login

When Surface Manager starts you are asked for your credentials. Default administrator credentials are:

Username: admin

Password: admin



First time logins as administrator will be asked to change password.

Note: Be careful and remember what the new administrator password is set to. If password is forgotten contact database administrator to reset the password in the database.

Note: The login method can be changed in the options dialog, after the first time login. Supported login methods are; Surface Managers own user handling, or single sign on using Active Directory. See [Login](#), page 144.

Dashboard

General

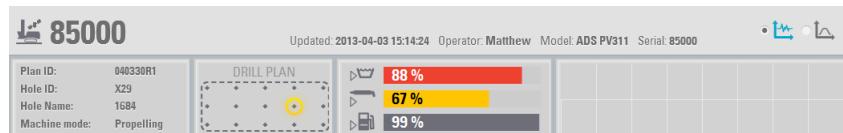
The dashboard provides an overview of the current status for a selected date.



1. All of the machines known to Surface Manager are shown. Machines are listed by their name. If no name has been given, the machine's name is the same as its serial number.
2. The upper dashboard section shows near real-time information for the selected machine. The performance and widget sections show data for the selected time period in the calendar in the bottom of the screen.
3. Click **Refresh** to make sure that the dashboard information is up to date.
4. The Toggle button allows the user to switch between single and multi-rig views.

Near real-time information

Select a machine and the most up-to-date information is shown.



Updated

The most recent timestamp when a Status log or Event log belonging to the specific machine was parsed by Surface Manager.

Operator

The last operator logged into the machine. This is read from the Event log.

Model

Machine model. This is read from the Status or Event log.

Serial

Machine serial number. This is read from Status or Event log.

Plan id, hole id, hole name

Shows the latest drilled hole and drill plan information. This is read from the Quality log.

Plan ID:	Garland test	+	+	+	+	+
Hole ID:	2	+	+	+	+	+
Hole Name:	hole 2	+	+	+	+	+
Drill Mode:	Drilling	+	+	+	+	+

Drill mode

The latest state the machine was in. This is read from the Status log.

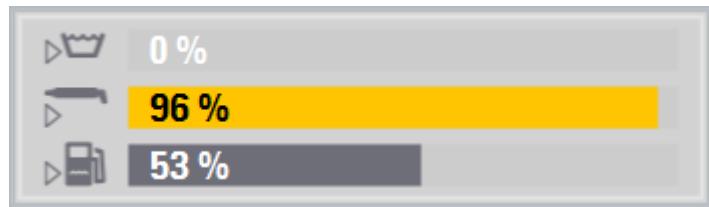
Drill plan management widget

Click Drill Plan to open the Drill Plan Management widget.



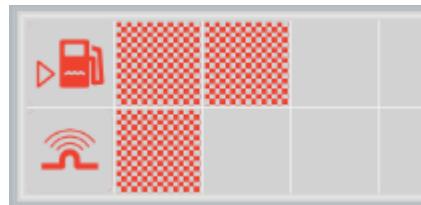
Water, lube and fuel levels

Fluid levels. Read from status log.



Fault codes

The current fault codes and warnings for the machine selected and supported by Surface Manager is shown. Fault codes older than one day will be hidden.



By hovering over the alarm icon with the mouse pointer, a tooltip is shown containing fault code text, number and timestamp when fault or warning occurred.



Drill statistics

Click to the right next to the selected machine title to change between near real-time information and statistics.



8999848801		Updated: 2012-05-09 12:57:44 Operator: ty Model: ADS DM45 Serial: 8999848801
System version:	4.6 rev.3	
Accumulated rotary time:	0 h	
Accumulated hole length:	45.9 m	
Total engine time:	639 h	
Total tram time:	0 h	

System version, accumulated rotary time, accumulated hole length, total engine time, total tram time

Statistics are read from the most recent status log.

Drill performance

Drill performance numbers are calculated from log data within the selected calendar period (selected at the bottom of the user interface).

Holes Drilled	Depth Drilled	Average Rate	Rotary Time	Engine Time
15	187.3 m	10.65 m/hr	03:43	12:00

Holes drilled and depth drilled

Number of holes drilled and the total depth drilled. A drill hole is considered to be drilled if the hole ends within the time period. Read from the Quality logs.

Average penetration rate

Average of all hole penetration rates, where the drill holes fall within the end hole time in the selected calendar time. This is read from the Quality logs.

Rotary and percussion time

Calculates the time spent rotary drilling and DTH¹ drilling. This is read from the MWD logs.

Engine time

The difference between the engine time in the last status log within the selected time period and the last status log occurring before selected time period.

Drill status

RRA Server is responsible for the communication with the machine; it both pulls log files off the machine and sends Drill Plans to the machines, along with the User and Delay code lists.

The machine's connection information is sent from RRA Server to Surface Manager.

The drill icon changes color depending on the RRA communication status. If the machine is equipped with GPS the GPS symbol is shown on top of the drill.

¹ Down The Hole

 8999848801

 GPS symbol

	Online	Green
	Offline	Yellow
	Unknown- Surface Manager does not communicate with RRA Server.	Gray
	Communication error	Red
	Machine needs to be confirmed in RRA client	Blue

Calendar

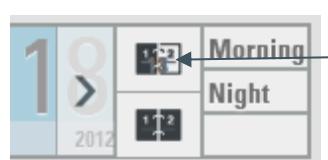
Use the calendar to select the time range of data populating the performance numbers and the widgets.

Days, weeks and months



Click Days, Weeks, or Months and the calendar will change accordingly. Select day to select a day. Select week to select whole week and select month to select whole month.

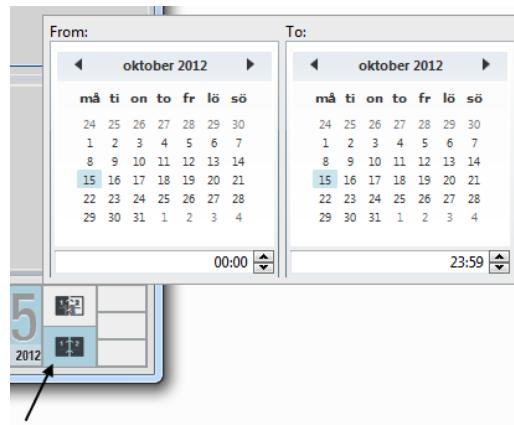
Today



Click on the Today icon to set today's date.

How to pick start and end date

Click on the **Time Range** icon to pick a start and end date.



Shifts



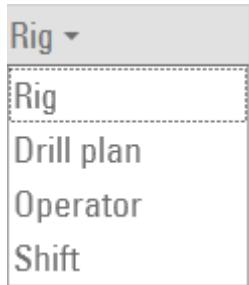
Shifts may be selected when a day has been selected.

Multi Rig Dashboard

Moving the toggle button to the rights enables the multi rig view.

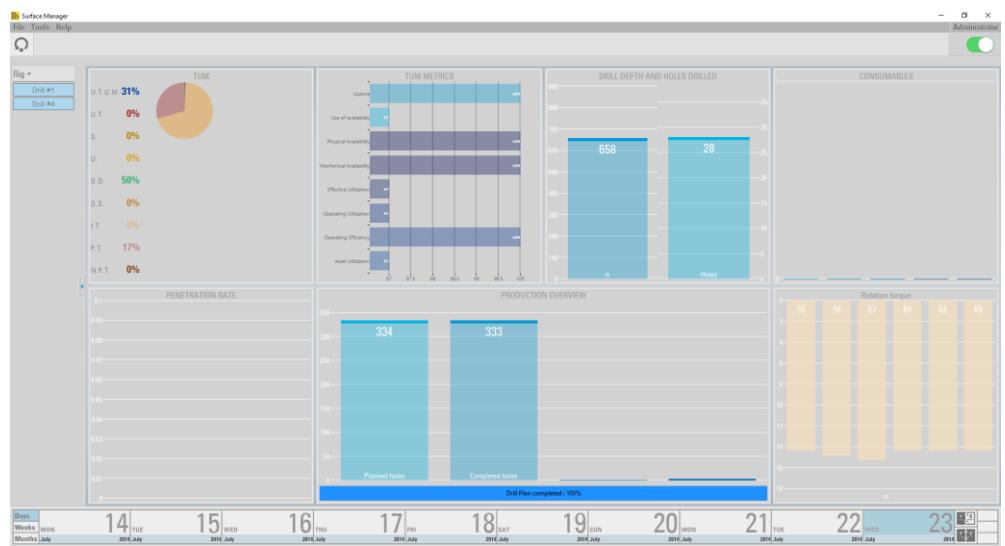


On the left side panel of the dashboard, the selection filters are provided.



User can choose one or more Rigs, Drill plans, Operators or shifts. These options get updated upon selection of the filters.

As the user selects/deselects the selection filters, the preview widgets get updated accordingly.



The Production Overview preview widget replaces **Planned Model Vs Drilled Model** preview widget in Multi rig mode.

User can see an overview of the number of

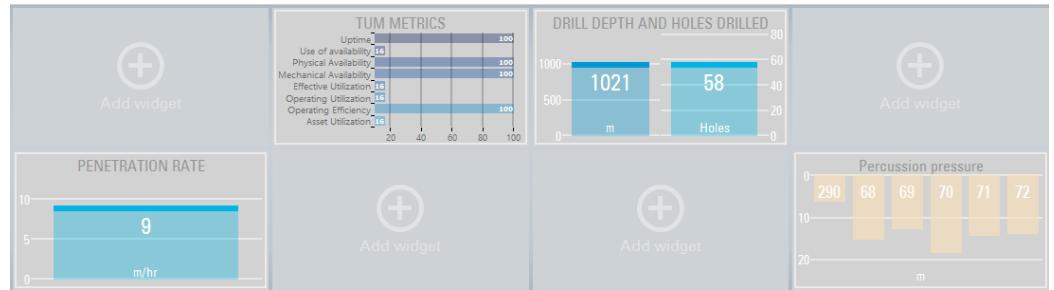
- planned holes
- completed holes
- redrills
- unplanned holes

When clicked on this preview widget, it opens up Planned Vs Drilled widget, which is the same as on Single Rig Dashboard.

Widgets

Overview

The dashboard shows previews of the selected widgets. Surface Manager allows the user to configure the screen to their preference of widget location.



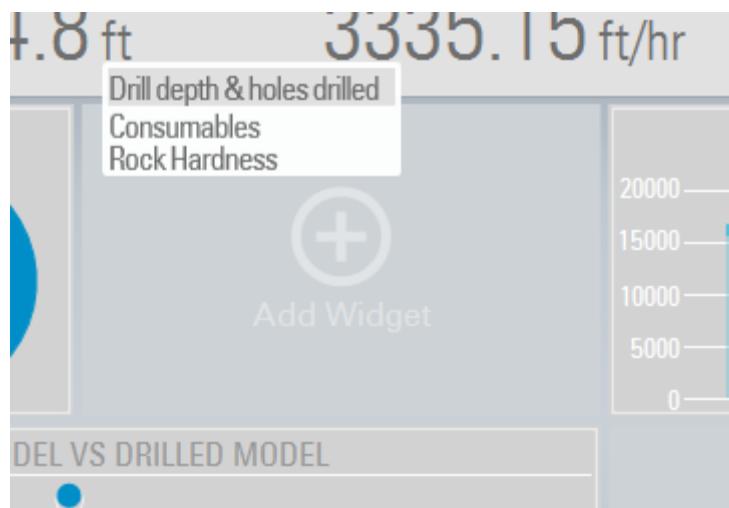
The widgets give an overview of the status for a particular date and time range.

The preview of all widgets are updated when the calendar changes.

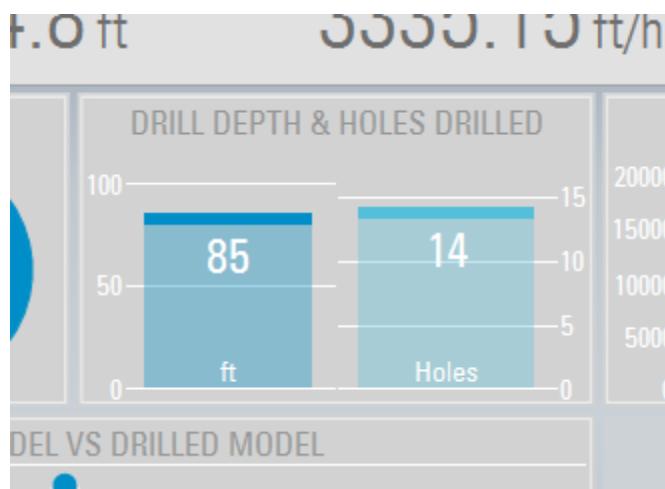
Click on a widget to open the details for that widget.

Adding a widget

Click in the middle of a widget position to show a menu of available widgets. Select one from the list.



The widget will be added to that position.



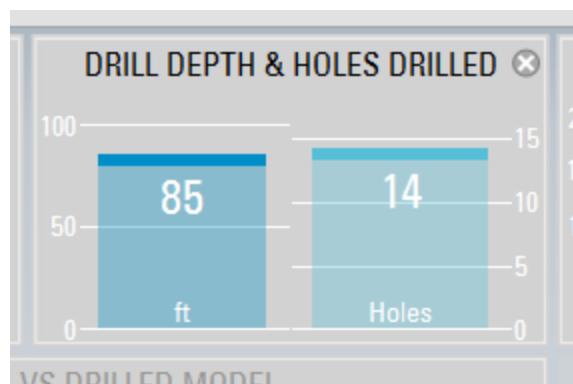
If a widget is too big to fit in a given position a red border is shown over the space it would be placed in.

Make room for the widget first by removing the widget that is blocking the new widget.



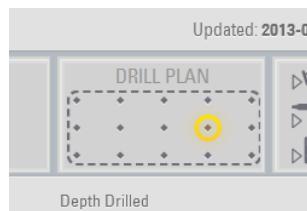
Removing a widget

On the top right corner click the close button. The widget will be removed from the dashboard.



Drill plan management widget

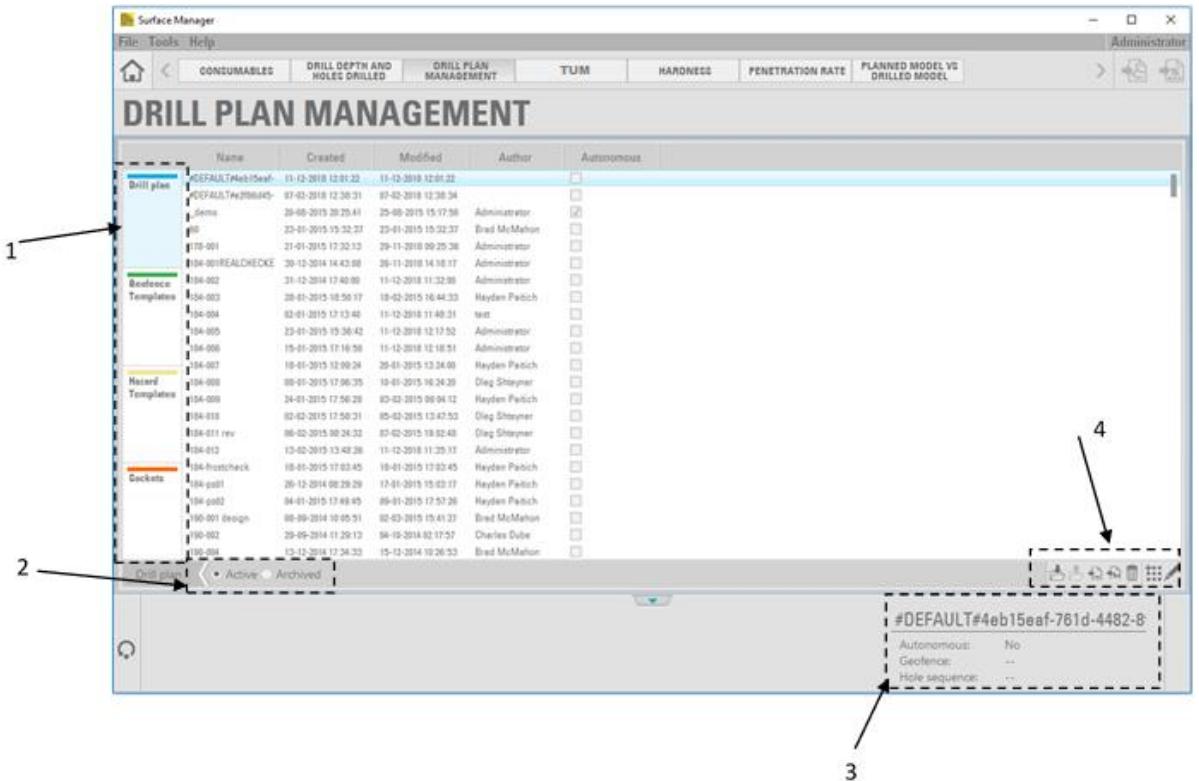
Dashboard



Click **Drill plan** on the dashboard to show the **Drill Plan Management** widget.

Drill plans, geofence templates, hazard templates and socket templates

The **Drill Plan Management** widget shows all drill plans, geofence templates, hazard templates and drill hole socket templates in the system.



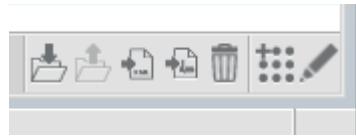
1. Select to view the drill plans, geofence templates, hazard templates or drill hole socket templates.
2. Select to show active or archived drill plan, geofence template, hazard template or drill hole socket template.
3. Displays any additional information on the selected drill plan.
4. Toolbar

The drill plan listing contains all drill plans in the system; name, when drill plan was created (imported), when the drill plan was modified, the author, and if the drill plan is an autonomous drill plan.

Note: A drill plan is autonomous when a geofence has been defined, and a sequence line is defined for that drill plan.

Drill plan actions

Actions that can be performed on a selected drill plan are: Archive, Unarchive, Export to file, Export to machine, Delete, Import, and Edit.



Note: Exporting a drill plan which has an active drill hole sequence, but not an active geofence, is not permitted by Surface Manager.

Geofence/Hazard actions

Actions that can be performed in the Geofence and Hazard templates are: Archive, Unarchive, Delete and Import.



Socket actions

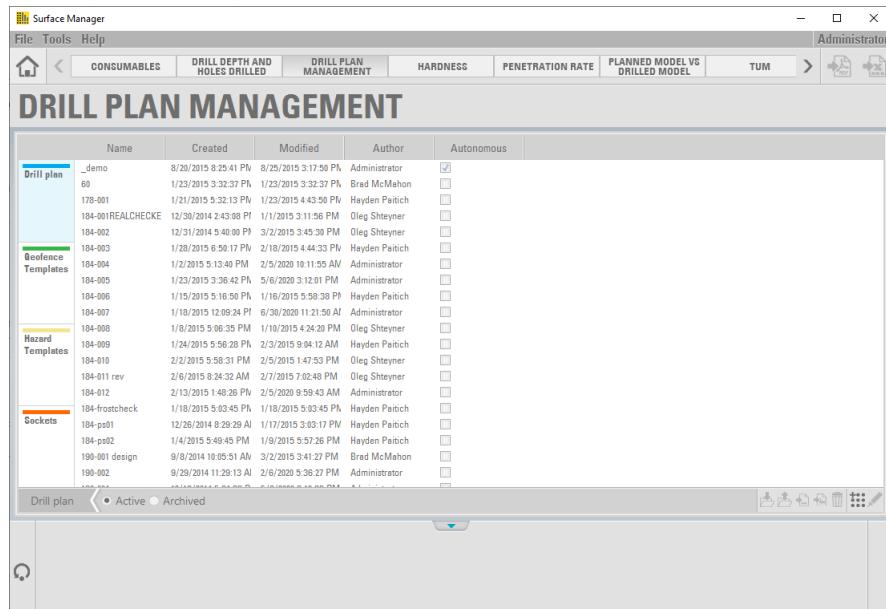
Actions that can be performed in the socket templates are: Archive, Unarchive, Delete and Import.



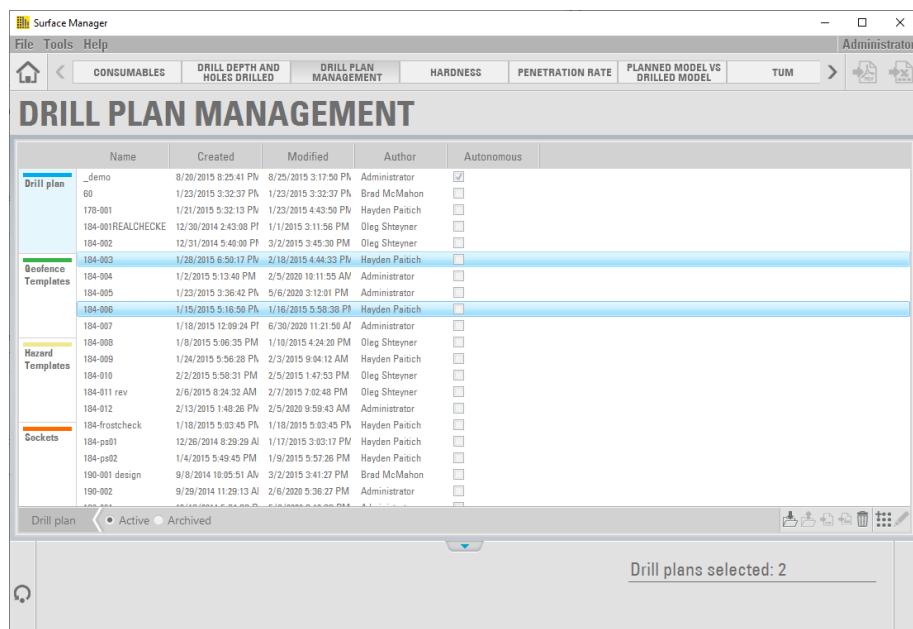
Selecting Multiple Drill Plans

The **Drill plans** list functions like any regular list in a standard Windows program. You can select one, many, or all the items in the list at once.

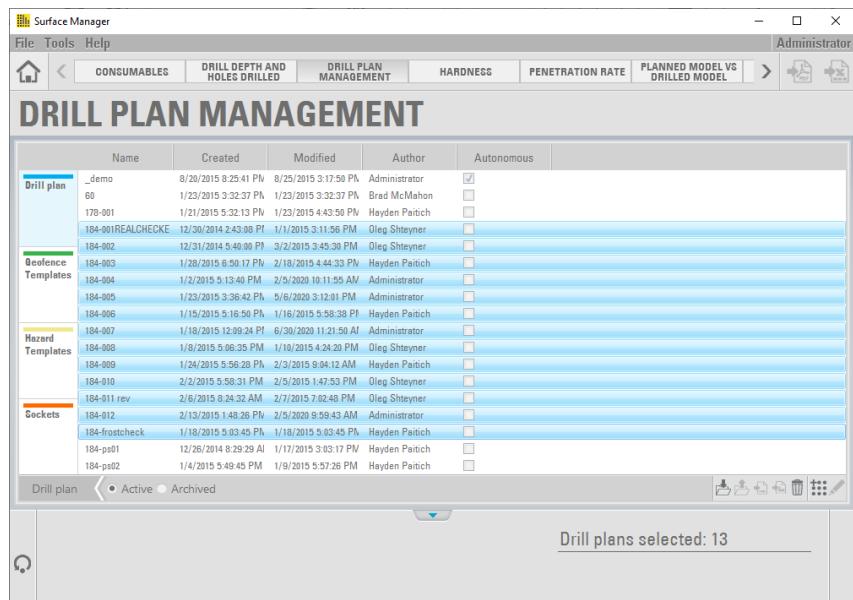
To select *one* item only, just click on an item. It will highlight in blue to show it has been selected, and the Information Area at the bottom right of the screen will show some information about that drill plan.



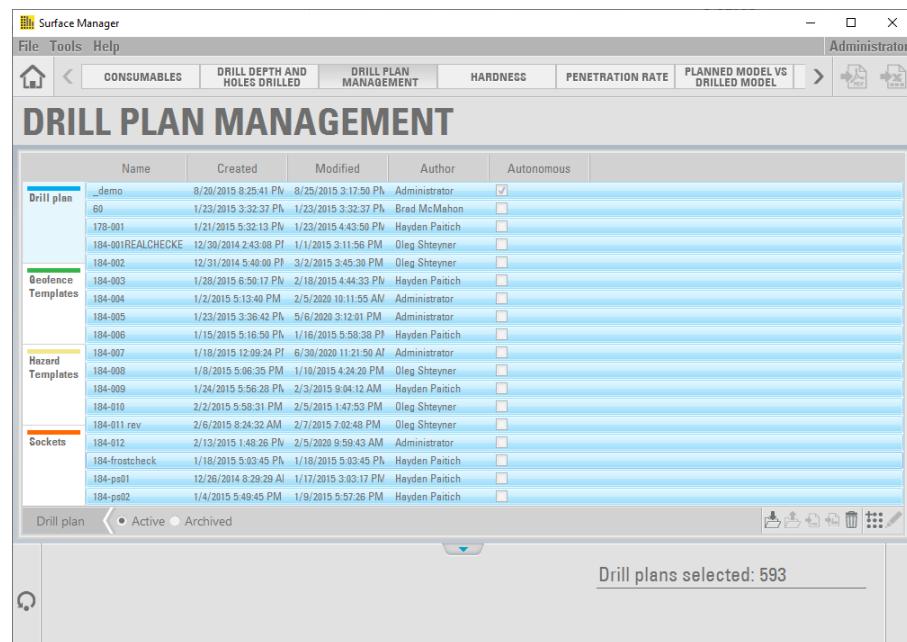
To select an extra drill plan, hold **ctrl**, and click on another item in the list. It will add that item to the current selection by also turning blue. When more than one drill plan is selected, the information area will display how many drill plans are selected.



To select a group of drill plans in one action, click on the first drill plan to select it. Then, holding down **shift**, click on the last drill plan you wish to select. It will automatically select these plus all drill plans in between.

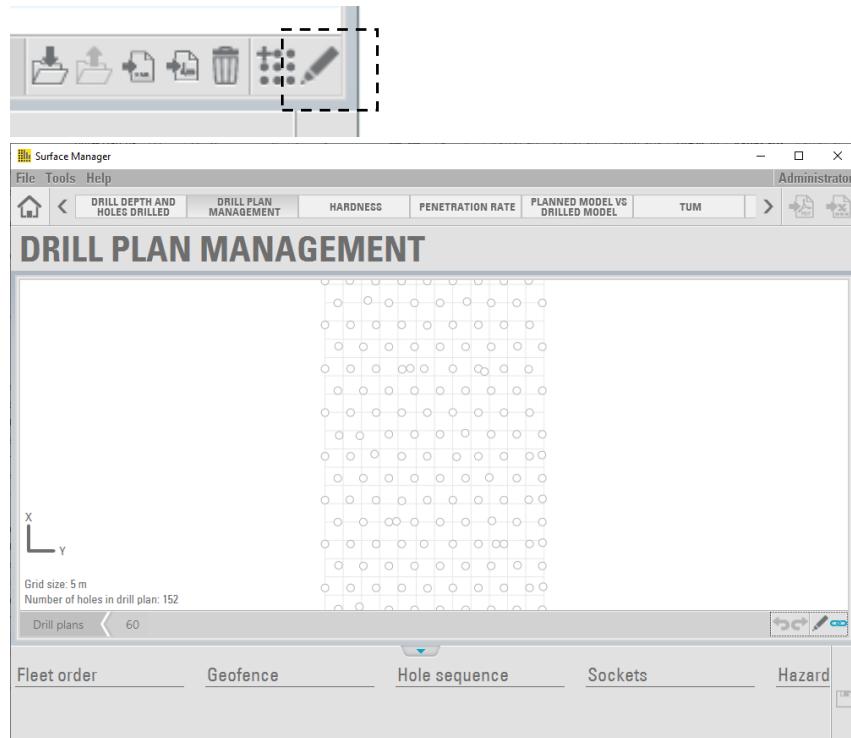


To select all drill plans at once, press **ctrl+a**.

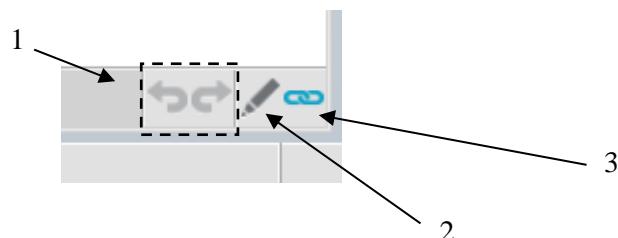


Edit drill plan

Select a drill plan and press **Edit**. You can also double-click on a drill plan to enter **Edit** mode.



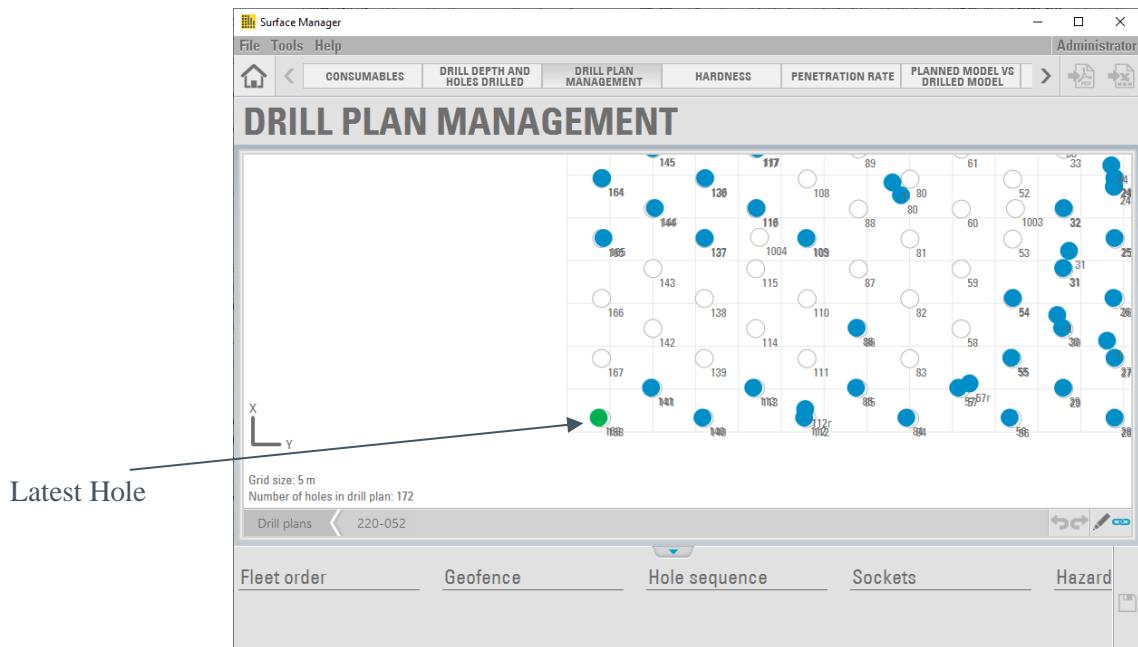
To navigate between edit modes or undo/redo use the toolbar in the bottom right.



1. Undo/redo
2. Enter/exit edit mode
3. Activate link mode (default mode)

Viewing the latest drilled hole

The last known drilled hole is shown as a green circle. This is based off the timestamp in the Quality log. The *EndHoleTime* is taken as the last known time the hole was drilled. The latest hole is the one with the *EndHoleTime* closest to the current time.



Note: Only one hole is considered latest, regardless of the number of machines drilling on the same drill plan.

Holes outside viewport

If the drill plan contains holes that are located more than 3 km away from the drill plan's median point, they will be removed from the viewer. An extra text will appear showing the number of holes that were not shown.



Note: These hidden holes will still show in report generation (Excel and PDF).

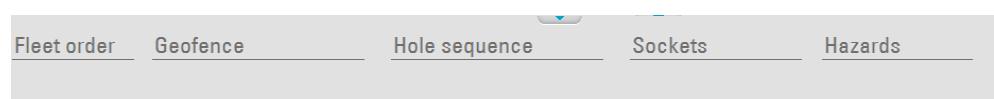
Edit mode

Press the **Edit** button to enter **Edit mode**.



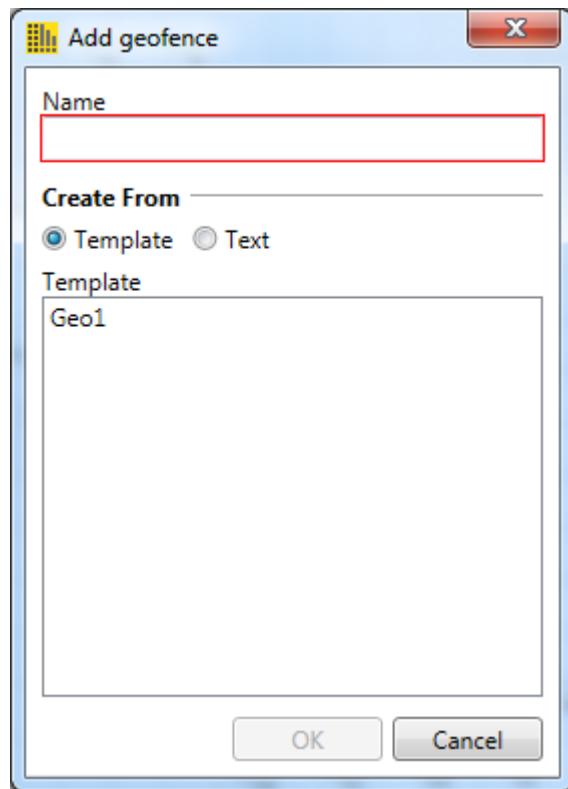
In Edit mode a geofence, drill hole sequence and sockets may be added.

Click + **Add** to add geofence, hole sequence, or sockets.



Add Geofence from template

Make sure **Template** is selected.



Click the template you wish to use from the list. This will automatically set the Name to match the selected template.

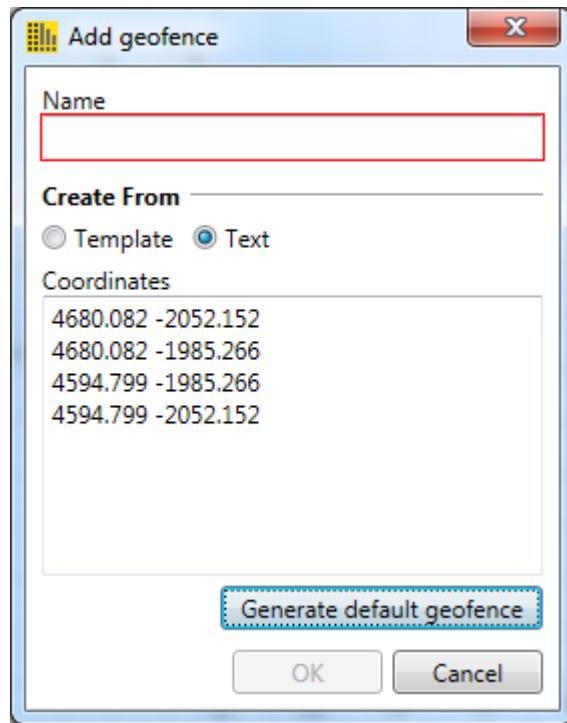
It is possible to type a new name after selecting a template.

Click **OK**.

Add geofence from text

Make sure **Text** is checked.

Type a name and enter coordinates.

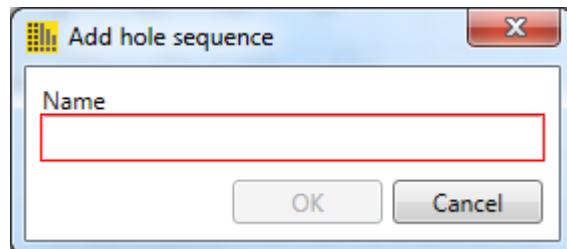


Instead of typing coordinates a geofence can be generated that contains all the holes.

Click **Generate default geofence**, to generate a geofence bounding all planned holes by a rectangle.

Click **OK**.

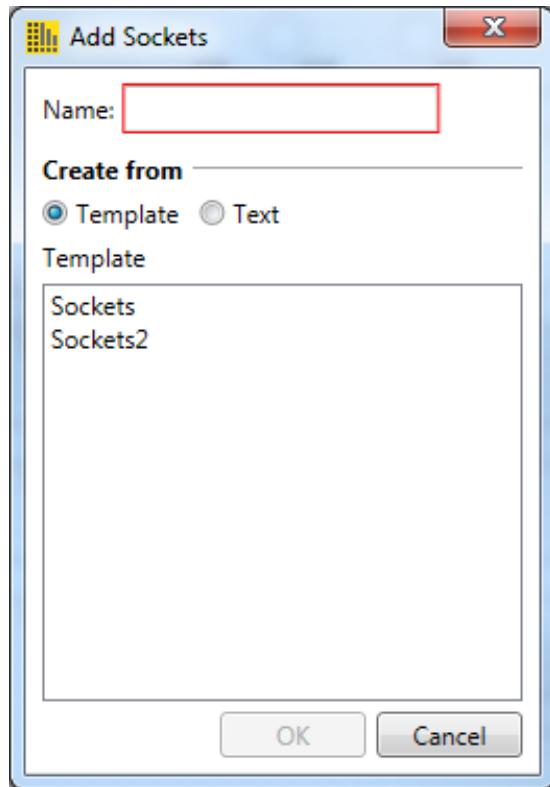
Add hole sequence



Type name and click **OK**.

Add Sockets from template

Make sure **Template** is selected.



Click the template you wish to use from the list. This will automatically set the Name to match the selected template.

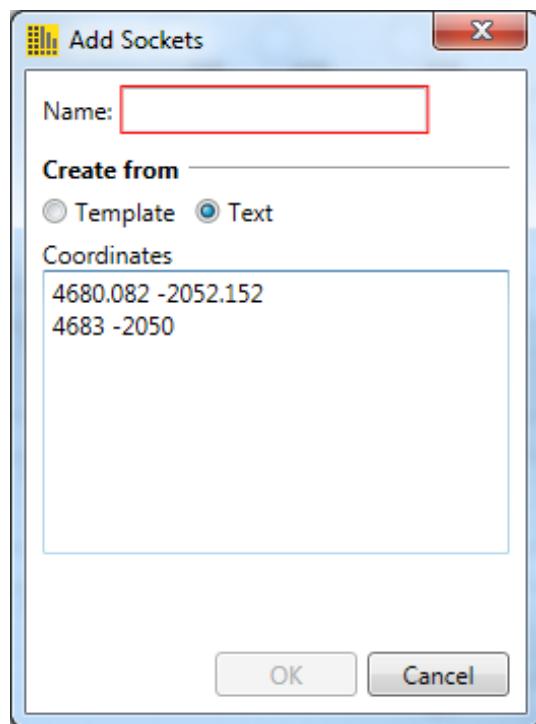
It is possible to type a new name after selecting a template.

Click **OK**.

Add Sockets from text

Make sure **Text** is checked.

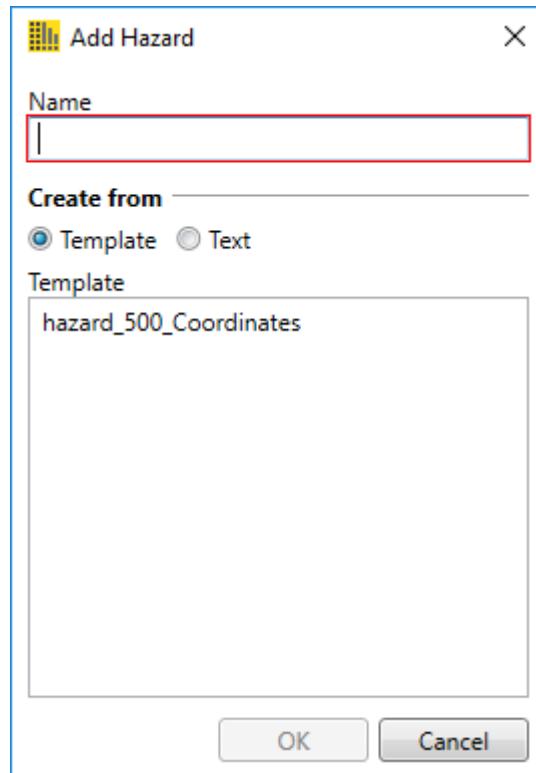
Type a name and enter coordinates.



Click **OK**.

Add Hazards from template

Make sure **Template** is selected.



Click the template you wish to use from the list. This will automatically set the Name to match the selected template.

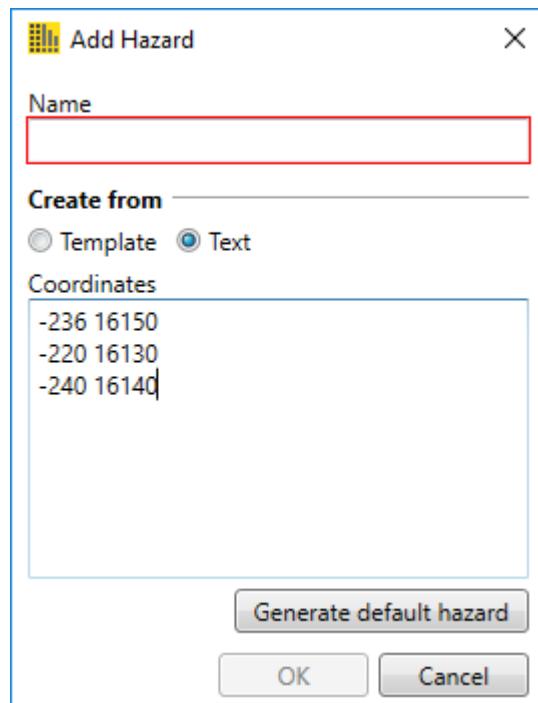
It is possible to type a new name after selecting a template.

Click **OK**.

Add Hazard from text

Make sure **Text** is checked.

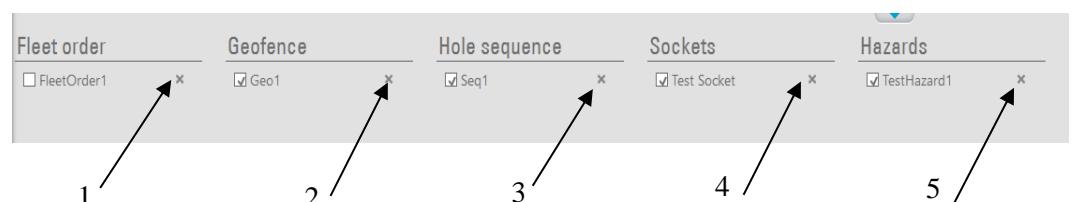
Type a name and enter coordinates.



Click **OK**.

Delete fleet order, geofence, hole sequence, sockets or hazards

Click the **Delete** (X) icon next to the fleet order, geofence, hole sequence, sockets or hazard to delete.



1. Delete Fleet order
2. Delete geofence
3. Delete hole sequence
4. Delete sockets
5. Delete hazard

Undo/redo

Use toolbar buttons to undo or redo actions.



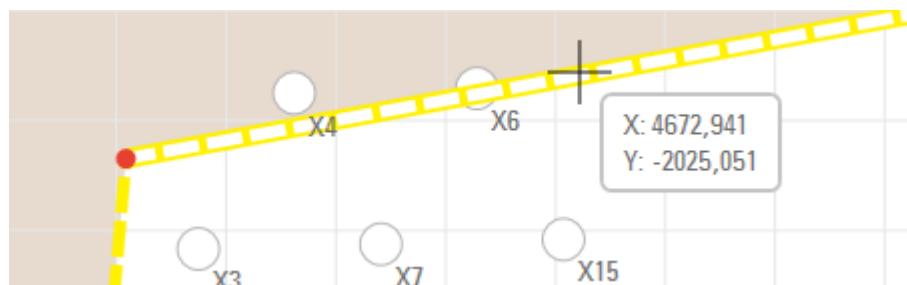
Save

When done editing, click the **Save** icon.

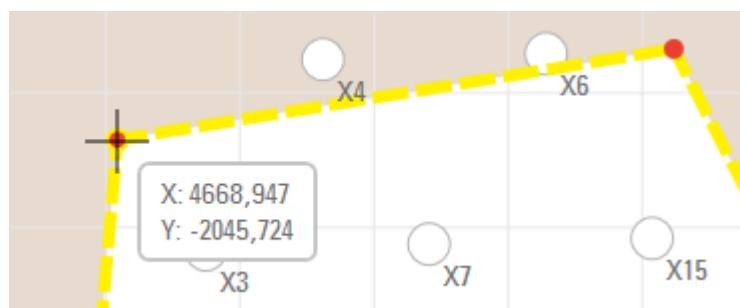
Modify geofence

Select point or segment

Select a point or segment by clicking that object.



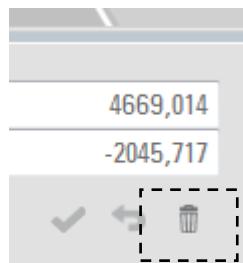
The color will change slightly to indicate that object is selected.



Delete point or segment

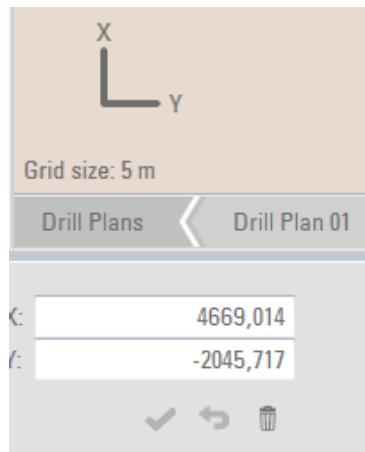
Select a geofence point or segment.

Press **Delete** on keyboard or click on the trash can (delete) icon.



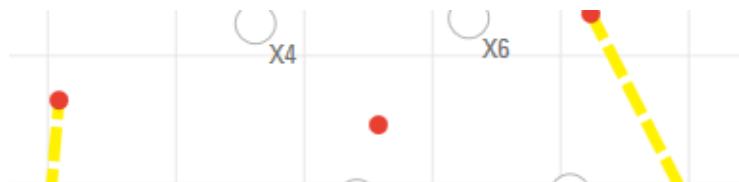
Update point

Geofence points may be dragged to a new position, or a coordinate may be entered in to the text boxes.



Add point

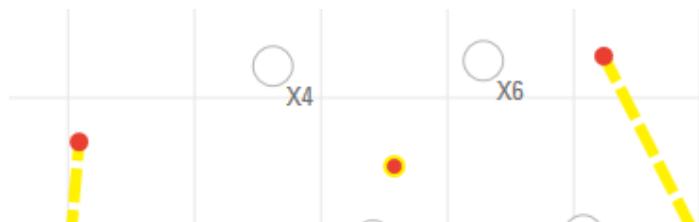
Double-click in an empty area on the drill plan.



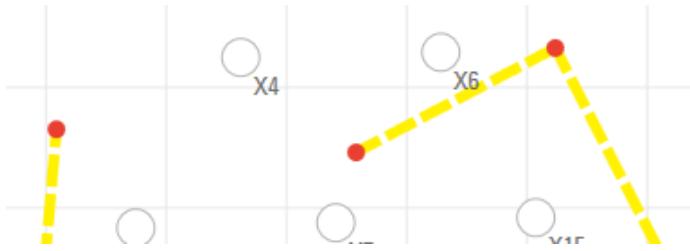
A new geofence corner point will be added.

Connect points

Click on the point to select it.



Double-click another point.



The points will be connected.

Modify sequence line

DRILL PLAN MANAGEMENT

Grid size: 5 m

Drill Plans Drill Plan 01

Hole sequence	Drill Plan 01
	Autonomous: Yes Geofence: geo 1 Hole sequence: seq 1

Add/remove holes in sequence using brush

The brush will let you to add or remove drill holes into a sequence.

Note: If drill holes are already included, they will be removed.

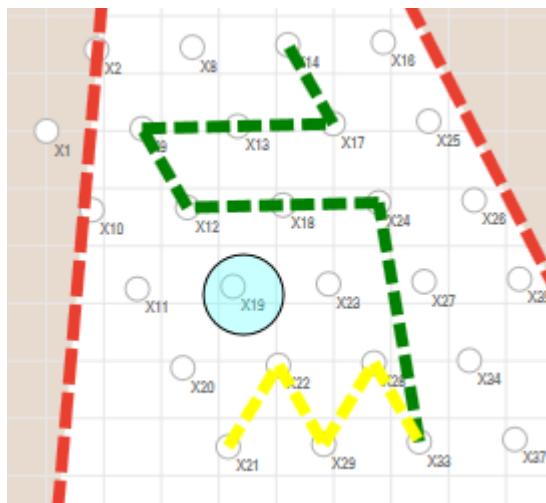
DRILL PLAN MANAGEMENT

Grid size: 5 m

Drill Plans Drill Plan 01

Hole sequence	Drill Plan 01
X21, X22, X29, X28, X33, X24, X18, X12, X9, X13, X17, X14, X19, X23, X20, X11	Autonomous: Yes Geofence: geo 1 Hole sequence: seq 1

- Yellow – Existing drill holes in the sequence
- Green – Drill holes to be added to the sequence
- Red – Drill holes that will be removed from the sequence



Add/modify/remove holes in sequence using text

The sequence may be modified in the text box. The visual will be updated immediately.

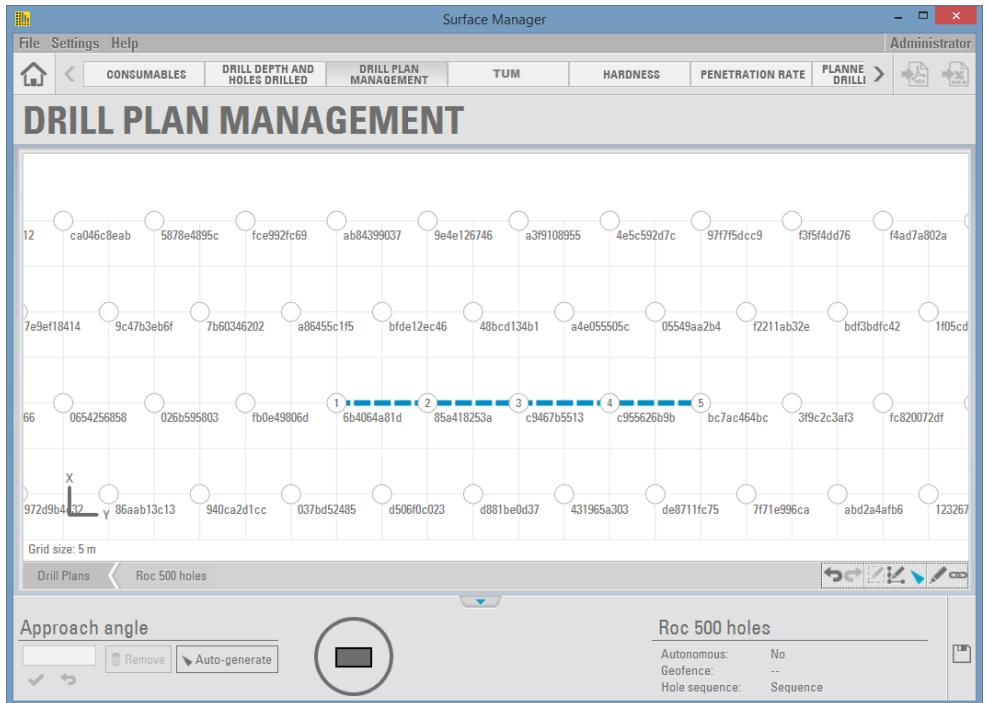


Modify hole approach angles

While in edit mode for Hole Sequence, it is possible to enter the Approach Angle smart tool by selecting the Arrow icon in the smart tool area.



The sequence line will change to a blue color when Approach Angle Editing is active.



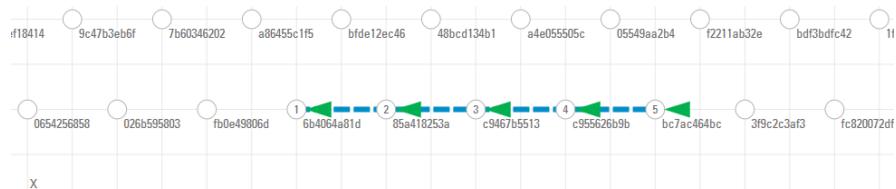
Add approach angles by Auto Generation

It is possible to quickly create approach angles for all holes in the active hole sequence by pressing the **Auto-generate** button.



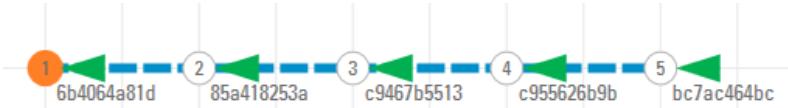
This will create the approach angles for the holes.

Green arrows indicate in which direction the machine will approach the hole from, with the small point representing the drill end.



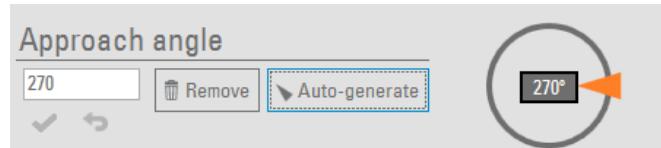
Adjusting approach angle of a hole by entering a value

To change the approach angle of a hole to a specific value, first click the hole that should be changed. Once selected, it will turn orange in color.



Additionally, the Approach Angle toolbar will show the current value of the approach angle in a text box.

The Approach Angle Wheel will show the value with an orange indicator representing the direction of the machine.



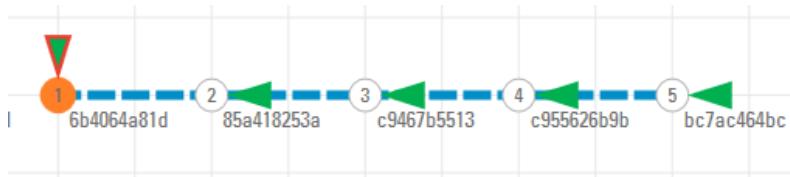
Simply type a new value into the white text box to change the value of the approach angle. This change will be previewed on the approach angle wheel to give a visual feedback.



Once a change has been detected, the tick and undo icons will activate. To save the changes to the angle, click the tick icon.

To undo, click on the **Undo** icon.

Once the change is saved, the drill plan will show the new approach angle.

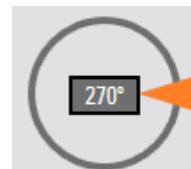


To finalize the changes to the drill hole sequence, click the **Save**  icon.

Adjusting approach angle using approach angle wheel

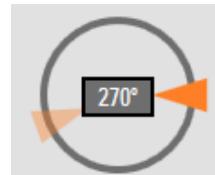
To change an approach angle in a more visual way, the approach angle wheel can be used to adjust the value with the mouse.

After selecting the hole to adjust, the approach angle wheel will load with the current value.



When the mouse cursor is moved onto the outside circle of the wheel, where the orange indicator is, a second ‘ghost’ indicator appears under the mouse

cursor. This indicates the new approach angle that will be applied to the hole if the mouse button is clicked.



If the mouse button is clicked, the new approach angle will be applied to the hole.



Fleet orders

Fleet orders enable a fleet of supported Epiroc machines to operate together on the same drill plan.

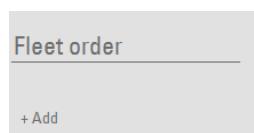
A fleet order is the final product of splitting a drill plan into multiple *work areas* and assigning individual geofences to each of them.

It is possible to have multiple fleet orders defined for a drill plan, but only one can be active at a time.

The primary reasons for fleet orders are to assign multiple operators to work on the same drill plan, or for autonomous and remote controlled operations where extra safety is required.

Creating a fleet order:

Open the drill plan in Edit mode and click **+ Add** in the Fleet order area.

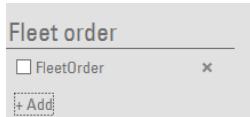


Type a name for the new fleet order.

In case of Pip viper special character permitted in name of fleet order.

In case of smart ROC names can have a-z, A-Z, 0,9, _.

The new fleet order will appear in the list.



Click the checkbox of the new fleet order to set it to active.



When the fleet order is activated, the **Work area** list will appear on the screen.

Work areas

A work area is a sub-division or sub-section of a drill plan, contained as part of a fleet order. A fleet order can have many work areas. Work areas are exported to machines for drilling. Each work area can only be exported to one machine at a time.

Each work area has its own geofence (called a sub-geofence) and sequence line.

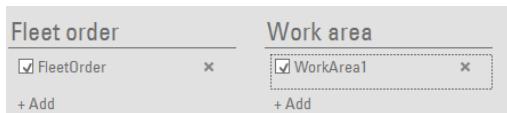
The sub-geofence must be entirely enclosed by the drill plan's geofence (called a master geofence).

Creating a work area

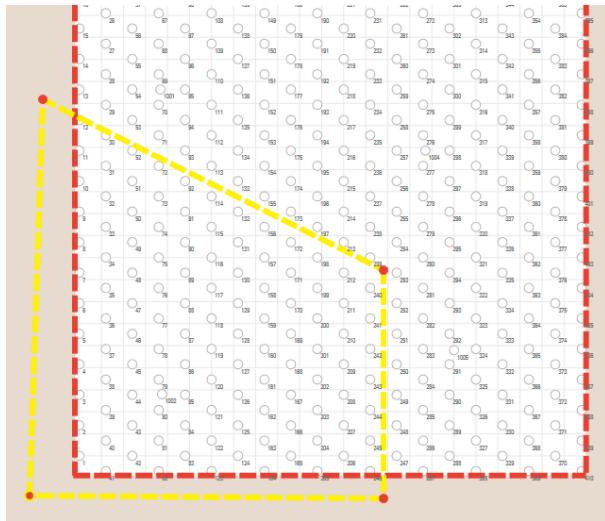
To add a work area, click **+Add**.

Enter a name for the new work area. In case of Pip viper special character permitted in name of fleet order. In case of smart ROC names can have a-z, A-Z, 0,9, _.

Click the check box to active work area.

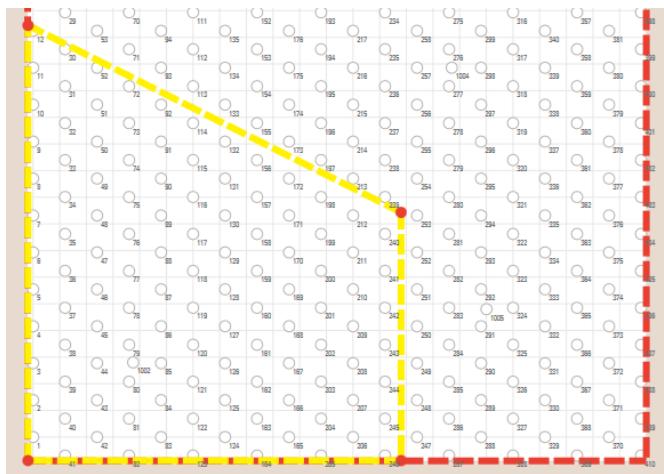


The drill plan view will now show changes being made to this work area.

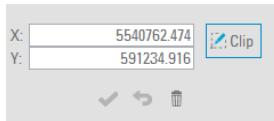


When the work area is active, the edit tools are enabled.

First, set a geofence for the area. Do this by manually, creating a small geofence around a set of holes.

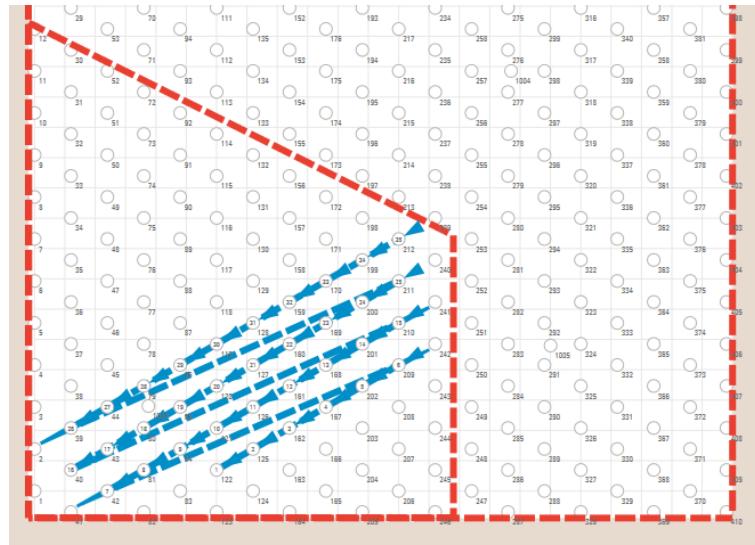


The sub-geofence must be clipped to fit inside the master geofence. To do this, press the **Clip** button on the bottom left of the screen.



The result is a perfectly aligned sub-geofence.

Create the sequence line for the machine to follow, and generate the approach angles.



When this is completed, link everything together to exit the editing mode for this work area.

The work area is now completed and ready to export to a machine.

Creating additional work areas

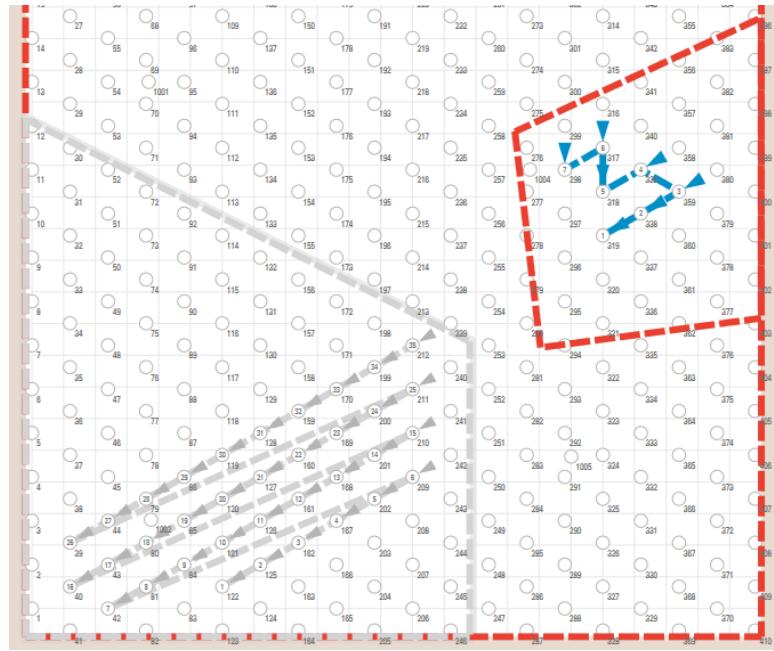
After creating the initial work area, additional work areas can be created under the same fleet order to enable multiple machines to operate on the same drill plan.

The same steps can be followed to create any extra work areas that are required.

There are some small quirks to be aware of when creating additional work area's:

Only the active work area is shown in color

While editing work areas only the currently active work area will be drawn with color on the screen. All other work areas are shown in grey.

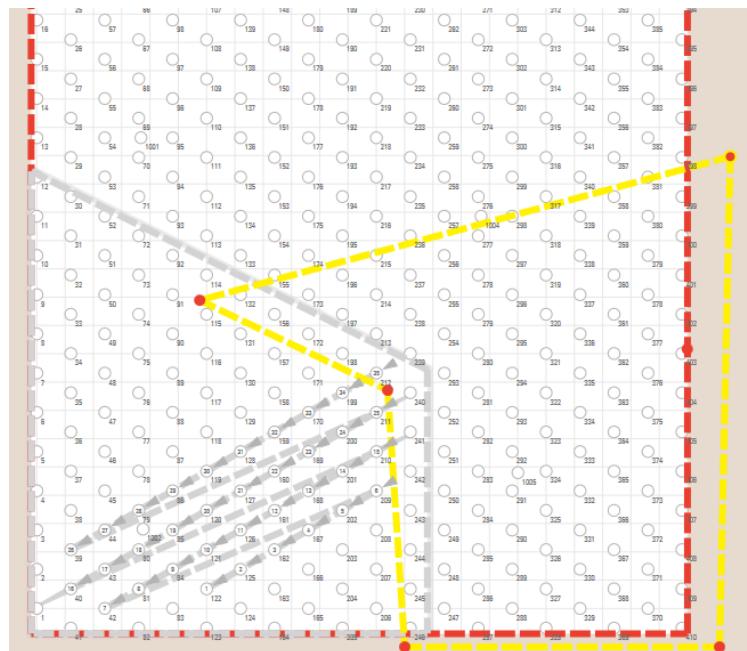


Sub-geofence safety area/no-go zone

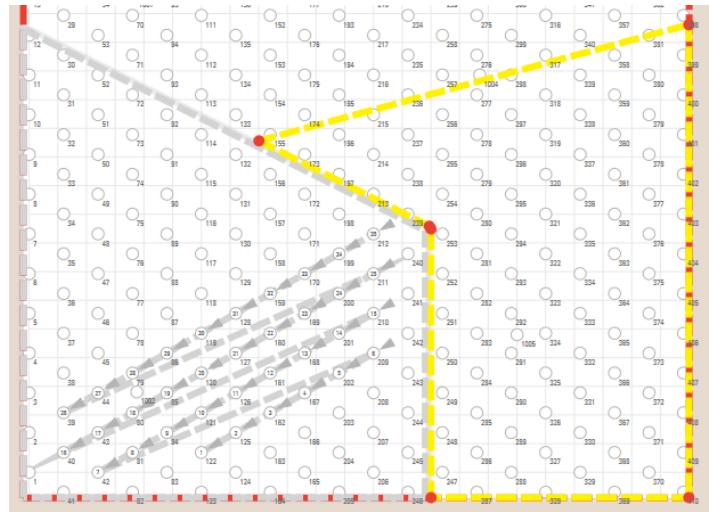
To ensure there is sufficient room for machines to maneuver on the edge of their assigned work area, there is a hard-defined no-go zone around the perimeter of every work area of one meter.

This zone is automatically calculated during the creation of each sub-geofence when the clip tool is used. For example, work area 2 follows on from the steps shown previously to create the initial work area.

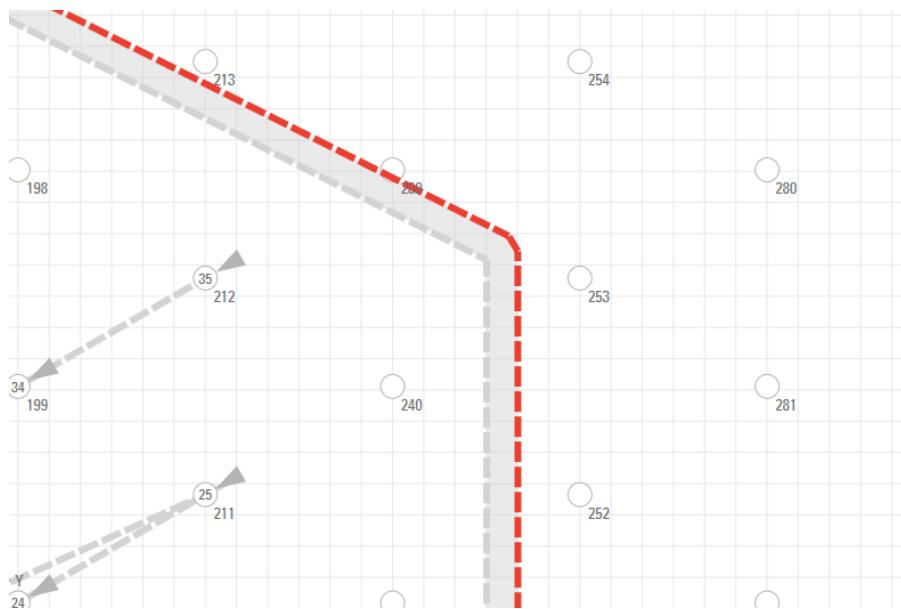
Suppose the sub-geofence was defined as shown:



Pressing **Clip** will trim this sub-geofence to fit inside both the master geofence, and all other sub-geofences defined in the fleet order.

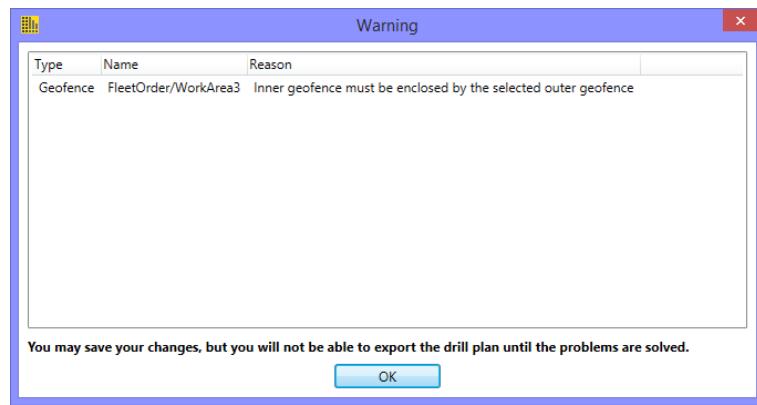


When zooming in to view the boundary between the two work areas, it becomes clear there has been a gap inserted of 1 m. The gap is shown in grey.



Work area validation

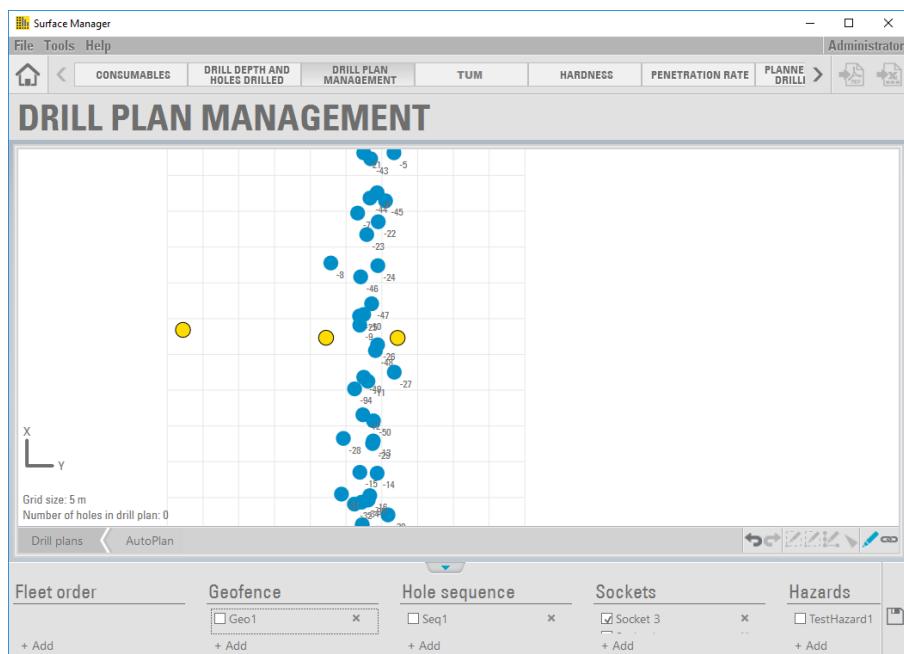
Surface Manager will attempt to validate the work areas when the save command is executed. A window will appear, listing any potential conflicts that were found.



Sockets

When a drill plan pattern has been blasted and the material cleared away, the very bottom of the drill holes in that pattern may protrude into the new pattern about to be drilled. These remnants may contain residual explosive material or blasting caps if the charge for that particular hole did not fully detonate.

Sockets makes it possible to see these previously drilled holes in the Drill Plan Management widget.



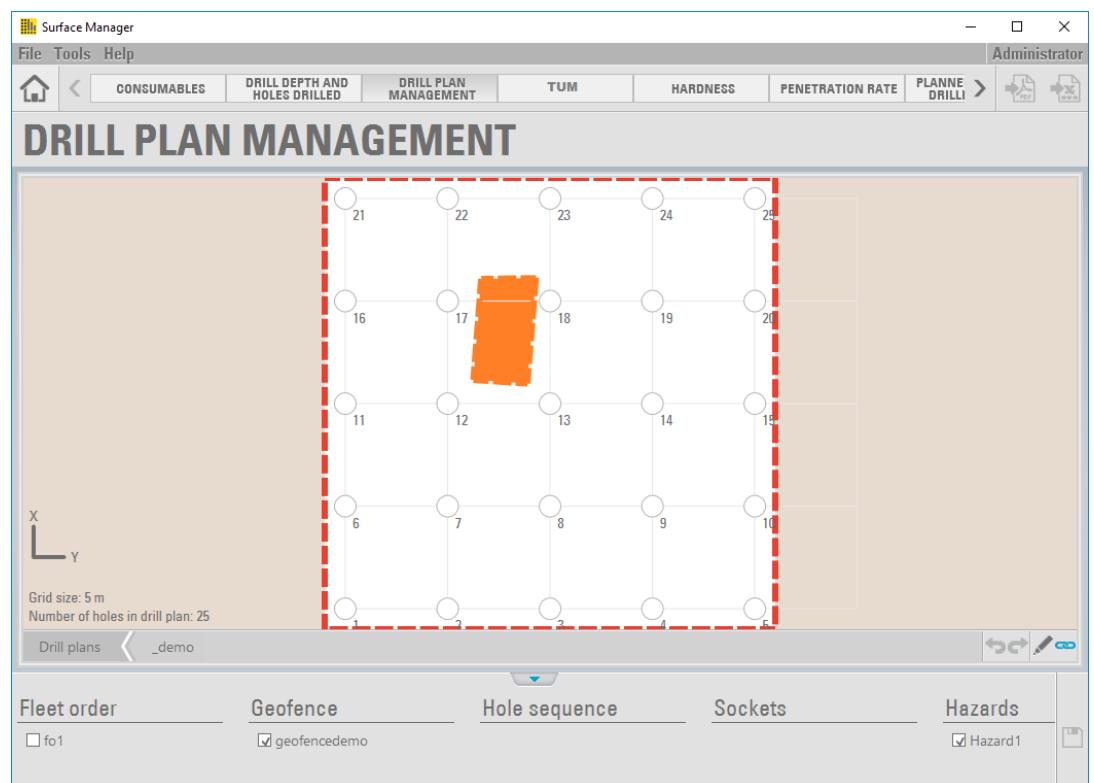
Drill hole sockets are shown as yellow with a black border.

Hazards

A drill plan pattern might have few obstacles which are supposed to be avoided by the rig.

Hazards makes it possible to see these obstacles in the Drill Plan Management widget.

Hazard lines can be selected, dragged and reconnected just like geofence.

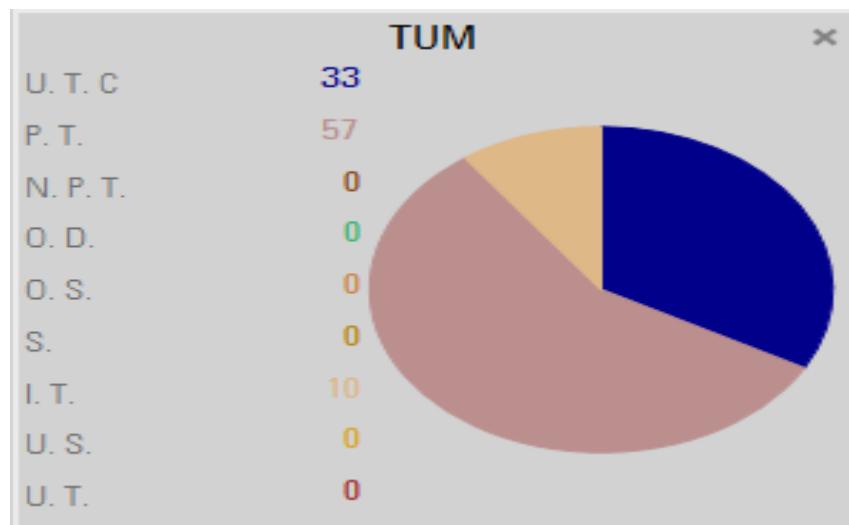


When a hazard layer overlaps with work area, points within hazard should be exported not the points which crosses fall on or outside of it.

Time Usage Widget

Preview

The Time Usage preview shows the percentage of the selected calendar time the machine has been in various Time Usage categories, as recommended by GMG (Global Mining Guidelines Group).



The Legends correspond to the leaf categories of the TUM hierarchy, along with one slot for unassigned TUM categories.

Legend	GMG Node
U. T.C.	Unassigned TUM Codes
U. T.	Unscheduled Time
S.	Scheduled
U.S.	Unscheduled
O. D.	Operating Delay
O. S.	Operating Standby
I. T.	Idle Time
P. T.	Productive Time
N. P. T.	Non Productive Time

How are the TUM Codes assigned?

TUM codes can be assigned in two ways: either by importing event logs from RCS where the TUM codes have already been mapped to categories or by manually assigning the categories to the codes in Event Editor.

Graph view

How are the TUM data calculated?

TUM is calculated either through the data imported from event logs or from the TUM category assigned in Event Editor.

How is the drilling data calculated?

Drilling time periods are calculated from start/end hole time stamps in the quality logs.

How are the drill mode, propel, setup, parked and delay code data calculated?

Time periods are calculated from events in event logs.

Time Usage Model Widget Mode

The drill usage widget has only percentage mode of operation.



My numbers does not sum to 100% exact?

When calculating the sum of the numbers displayed the sum might not exactly evaluate to 100%. This is because a rounding-error happens. Behind the scenes the number is represented by a higher resolution, and thus this round-off error is only applicable in the visualization of the numbers.

If a higher resolution of the numbers is required, the Excel report can be used.

Time Usage

The widget shows the time line for the percentage the different time usage categories occur.

The lanes are organized as recommended by GMG standard and can be navigated through by clicking on the legends.

The information shown reflects the leaf nodes of the GMG hierarchy.

Drill states

The blue bar indicates the time periods and total usage of the selected machine(s) drill states.

Drilling	The machine is in progress drilling a hole.
Drill mode	The machine is either drilling or stand-by drilling.
Propel/Tram	The machine is moving to another location.
Positioning/Setup	The machine is making adjustments to position itself before drilling.
Parked	The engine is not running.
Idle ²	The machine is idle.
Rod handling ²	The machine is actively handling the rods.
Tum code	The machine is running under an active Tum code.

Order of precedence (when multiple usage categories occurs during the same period of time)

Tum code

Parked

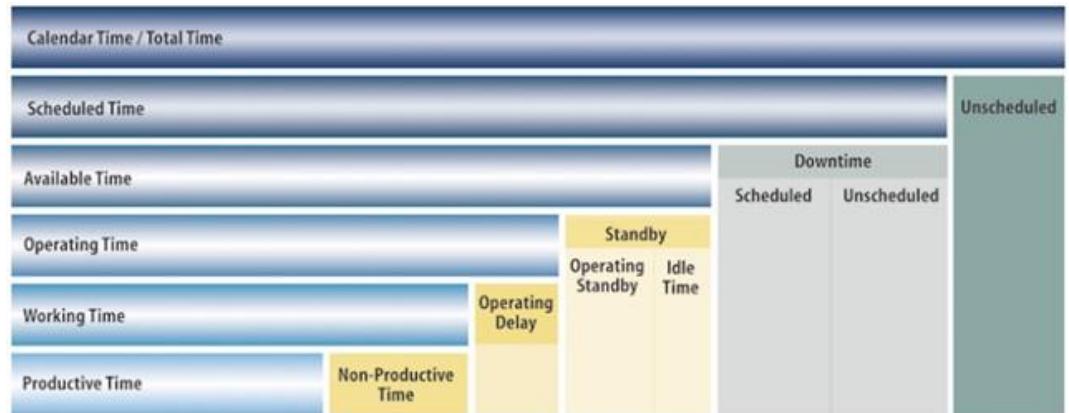
Drilling

Drill Mode, Propel/Tram, Positioning/Setup, Idle2, Rod handling2

² Available depending on machine family and capabilities on the machine.

TUM Categories

TUM widget shows the lane as per the allotment done for TUM categories, starting from the root node (Calendar Time) till the leaf nodes as shown below.



This lane shows the TUM categories the machine was running under.



User can navigate to the TUM categories under Scheduled Time, by clicking on that legend as below



The widget will then show the corresponding lanes in the TUM lane

Automation Modes

The purple bar indicates the time periods and total usage of the selected machine(s) automation modes. This is used to view if a machine is being controlled manually, remotely or autonomously.

The following values are possible to be seen in the Machine State:

Local Manual	An operator is in the cabin at the controls.
Remote Switched	The machine is in remote mode, but nobody is connected to it.
Teleremote Allocated	An operator is connected to the machine from an operator station.

Autonomous	The machine is running in automation without an operator.
E-Stop	The machine is under Emergency Stop.

Auto Functions

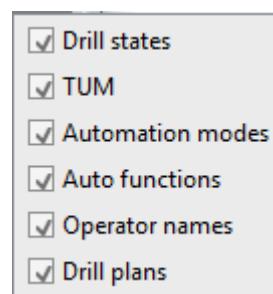
The green bar indicates the time periods and total usage of the selected machine(s) automatic functions. This is used to assist in making an assessment as to how efficiently a machine is being used. It can also help to make comparisons between machines and machines/operators.

The following values are possible to be seen in the Auto Functions:

Manual	The operator is manually operating the machine.
Auto Navigation	The machine is traversing the computed best path between 2 holes using the HNS.
Auto Level	The machine is extending the jacks and self levelling.
Auto Drill	The machine is drilling a hole autonomously
Auto Delevel	The machine is retracting the jacks.

Time Usage Filtering

It is possible to filter which data layers are drawn in the drill usage time and total modes. Clicking the filter button at the top of the widget opens a filter menu. Check the box next to the data layer you wish to observe.



The selection of enabled and disabled layers is saved for each user in the system.

The selection also affects what will be included in the report.

Tum codes

Click on **Tum code** to show a break out of TUM codes.



Reporting

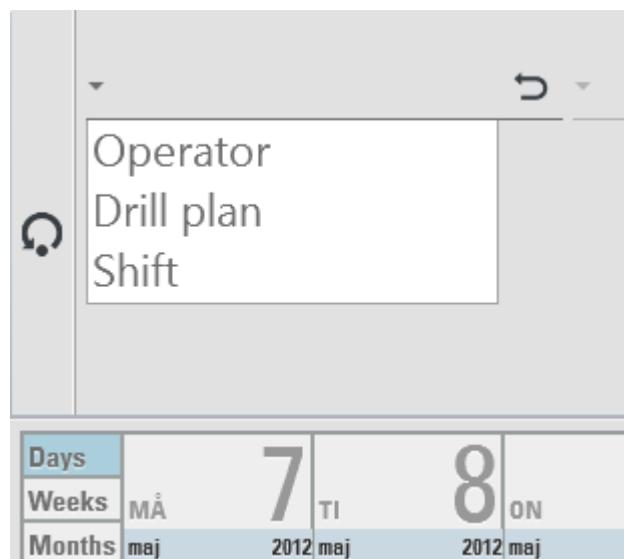
Select the desired report by clicking the Excel or PDF icon.

Depending on whether the Time or Total views are active the report will reflect the view.

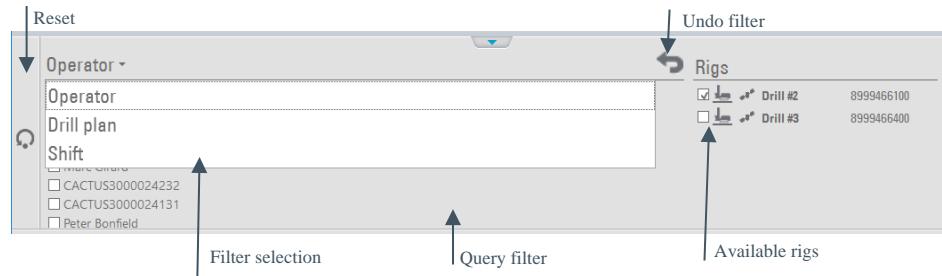
How to build a query

To filter the query, make sure the desired calendar range is set.

Start by selecting Operator, Drill plan, or Shift.



Continue to add filter until satisfied. To undo a filter click undo icon. The available machines shows up to the right.

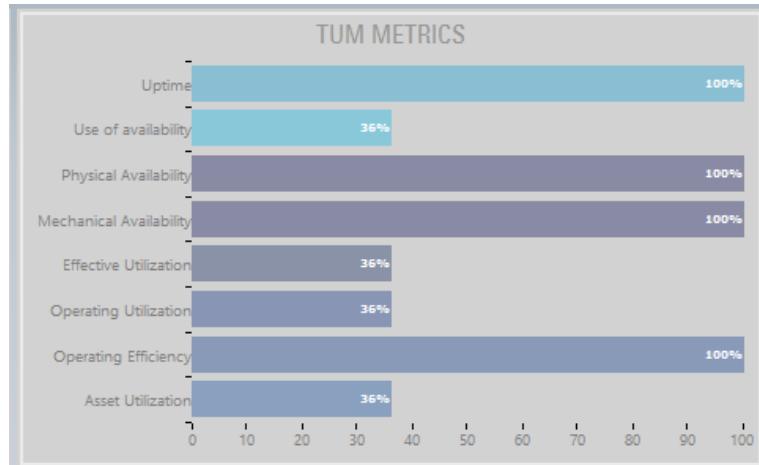


When selecting machines the drill usage chart shows filtered data within the selected calendar time range.

TUM Metrics

Preview

Tum metrics is a dashboard used by management to get an overview of the efficiency of the drilling operations.



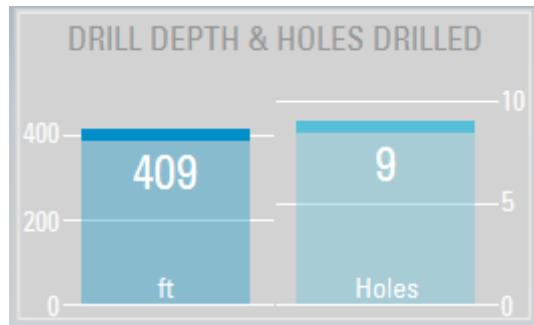
Below are the parameters used in tum metrics and the corresponding formula to come up with the calculations.

Asset Utilization	Operating time/Calendar
Effective Utilization	working time/scheduled
Operating Utilization	operating time/scheduled
Use of Availability	operating time/operating time + standby
Mechanical Availability	Operating time/Operating time + down
Physical Availability	Available/Scheduled
Uptime	Available time/ Calendar Time
Operating Efficiency	working time/Operating time

Drill depth and holes drilled widget

Preview

Shows drilled depth and number of holes drilled.

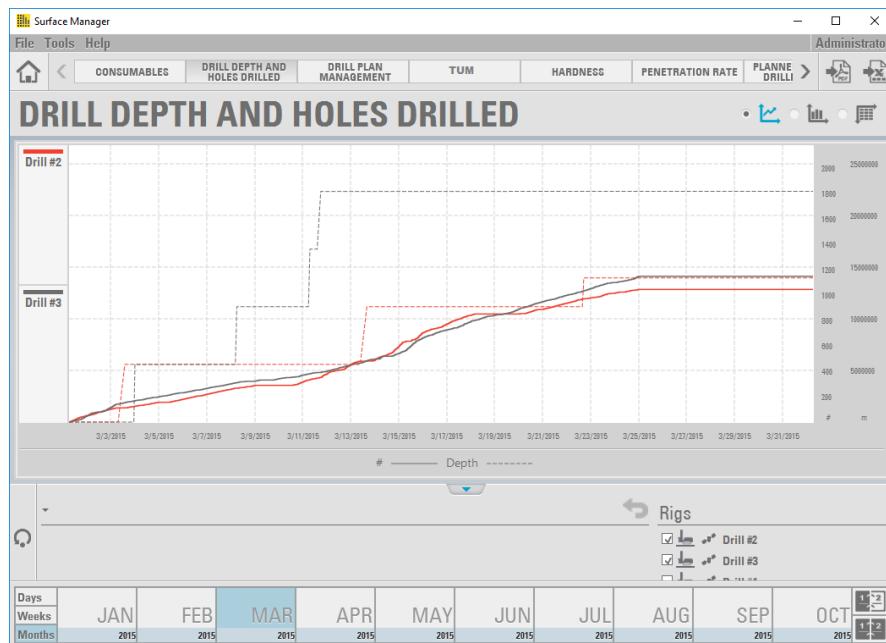


How are the drilled depth and holes calculated?

Holes are included in calculation if the end hole time in the quality log is within calendar time period.

Graph view

The drilled depth and number of holes drilled are shown for each selected machine.

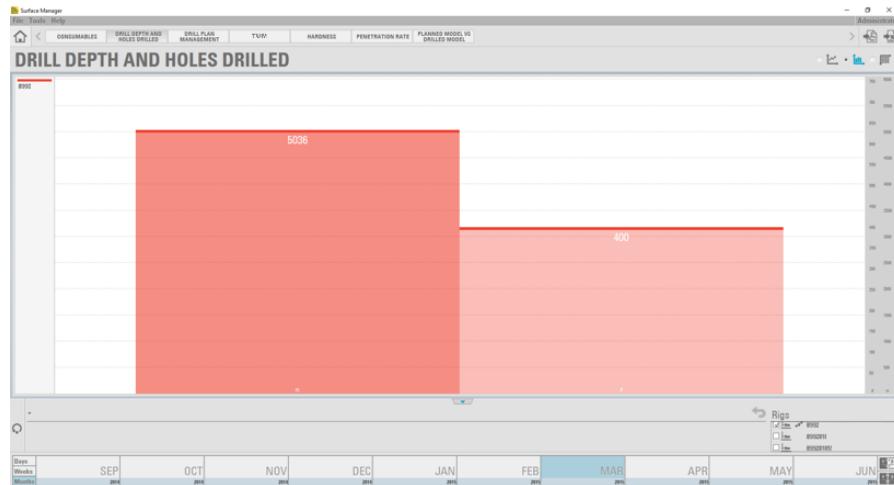


How are the drilled depth and number of holes calculated?

Holes are included in calculation if the end hole time in the quality log is within calendar time period.

Histogram view

Select the histogram icon on the top right to change to histogram view.



Tabular view

Select the tabular icon in the top right to change to tabular view.

Time	Drill Depth (m)	Holes Drilled
00:00	0	0
08:00	200	20
16:00	419	41
24:00	606.6	60
32:00	742.7	80
40:00	872.5	90
48:00	1118.3	111
56:00	1573282.8	113
64:00	1573412.2	121
72:00	1573441.8	122
80:00	1573671.7	140
88:00	1573686.6	154
96:00	1573783.6	156
104:00	1573810.3	159
112:00	1574137.1	173
120:00	1574332.1	190
128:00	1574326.1	204
136:00	1574323.3	213
144:00	1574695.6	229
152:00	1575055.3	243
160:00	1575214.6	255
168:00	1575241.6	267
176:00	1575475.2	274
184:00	1575519.8	285
192:00	1575621.9	289
200:00	1575672.9	289
208:00	1575672.9	289
216:00	1575672.9	289
224:00	1575686.1	290

Reporting

Select the desired report by clicking the Excel or PDF icon.

How to build a query

To filter the query, make sure the desired calendar range is set. Start by selecting operator, drill plan or shift.

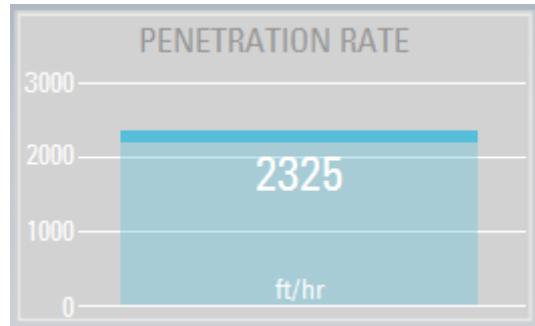
Continue to add filter until satisfied. To undo a filter click undo icon. The available machines shows up to the right.

When selecting a machine, the drilled depth and holes drilled for that machine within the calendar range and valid by filter will be included in the chart.

Penetration rate widget

Preview

The preview shows the average penetration rate in the selected calendar period.

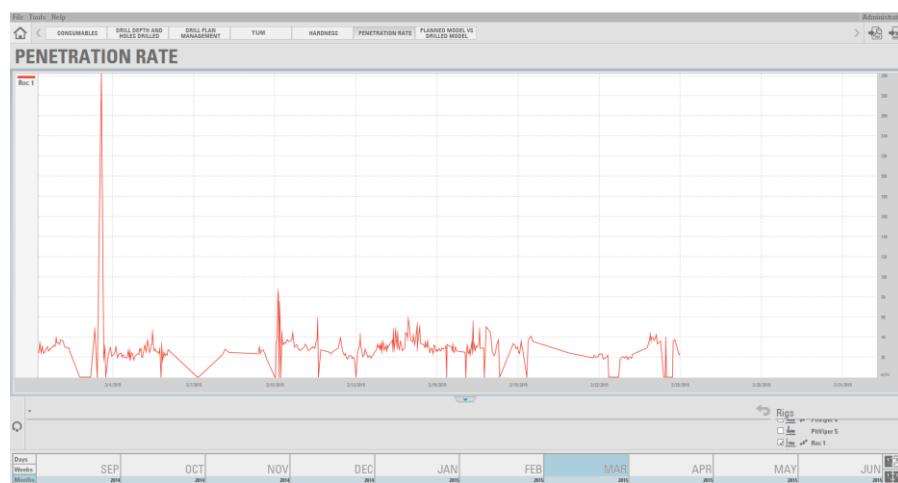


How is the average penetration rate calculated?

The value is calculated by averaging all holes drilled. Average penetration rate is read from quality logs.

Graph view

The detailed view shows the penetration rate by time.



How are the penetration rates calculated?

The penetration rates are calculated from samples in MWD logs.

Reporting

Select the desired report by clicking the Excel or PDF icon.

How to build a query

To filter the query, make sure the desired calendar range is set. Start by selecting operator, drill plan or shift.

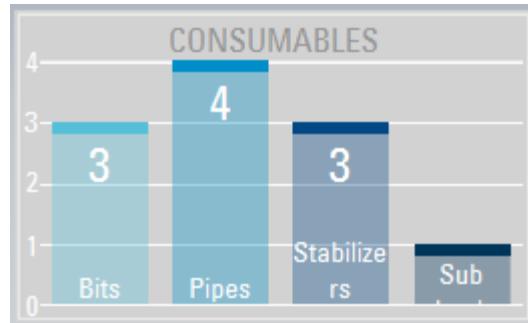
Continue to add filter until satisfied. To undo a filter click undo icon. The available machines shows up to the right.

When selecting a machine, the penetration rate is calculated for that machine within the calendar range and valid by filter.

Consumables widget

Preview

The preview shows the number of consumable changes occurring during the calendar time period.

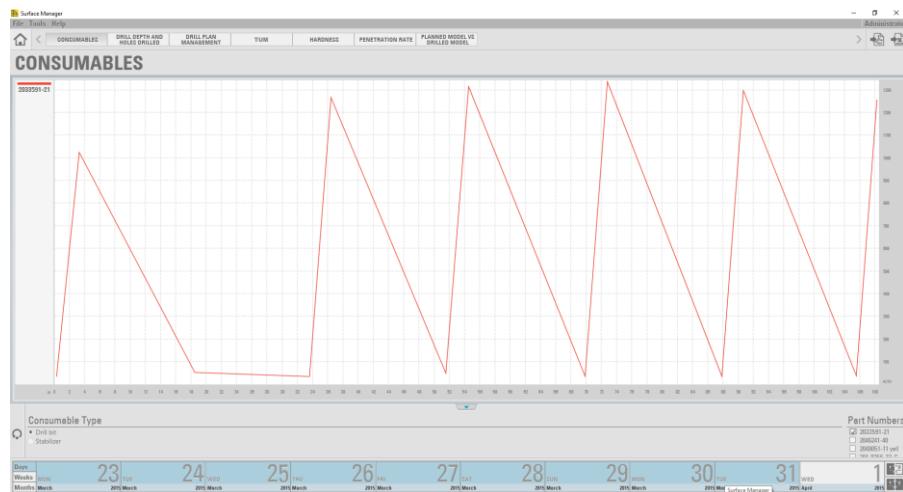


How are the bits, pipes, stabilizers and sub-shocks numbers calculated?

The consumable type's numbers represent the number of consumable changed events, in event logs, occurring during the calendar period and matching the specified consumable type.

Graph view

The consumables view shows the performance in penetration rate (y-axis) by depth drilled (x-axis) for the selected consumables.



Start by selecting the consumable type to look at. Then select the part numbers to compare.

How are the penetration rate calculated?

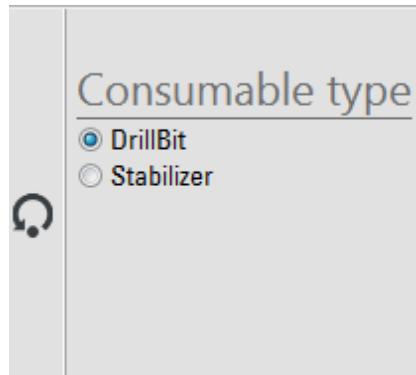
A part number is considered used on a specified drill between a consumable changed event and the next consumable changed event of the same type read from the event log.

Average penetration rate for a hole is read from the quality log. The consumable is assumed to be used when drilling a hole if the drilled hole end time is within consumable changed events.

How to build a query

To filter the query, make sure the desired calendar range is set. The available consumable types within the calendar range are listed.

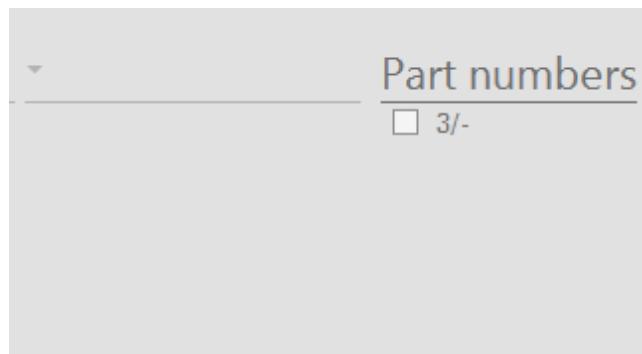
Start by selecting consumable type.



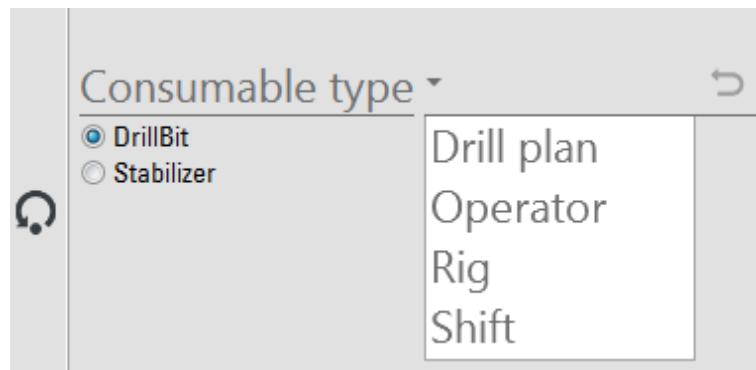
Continue to add filter for the Operator, Drill plan, Shift or Rig, until satisfied.

To undo a filter, click the **Undo** icon.

The available part numbers for consumables will appear to the right.



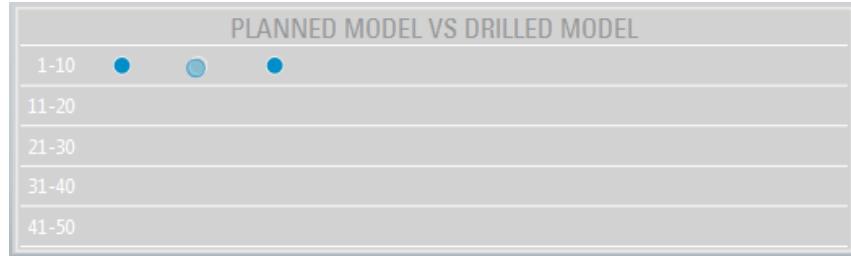
When selecting a part number, the part number's penetration rate is tracked throughout that part number's lifetime within Surface Manager.



Planned model vs drilled model widget

Preview

This preview widget is available only in Single Rig View mode. The preview shows the latest drilled holes with a matching planned hole.

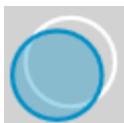


Explanation of symbol scenarios



The drill hole has been drilled within deviation limits specified in preferences.

See [Edit the hole depth deviation limit and distance deviation limit](#), page 146.



The drill hole has exceed the deviation limits specified in preferences. The transparent circle indicates which direction the drilled hole is in relation to the planned drill hole.

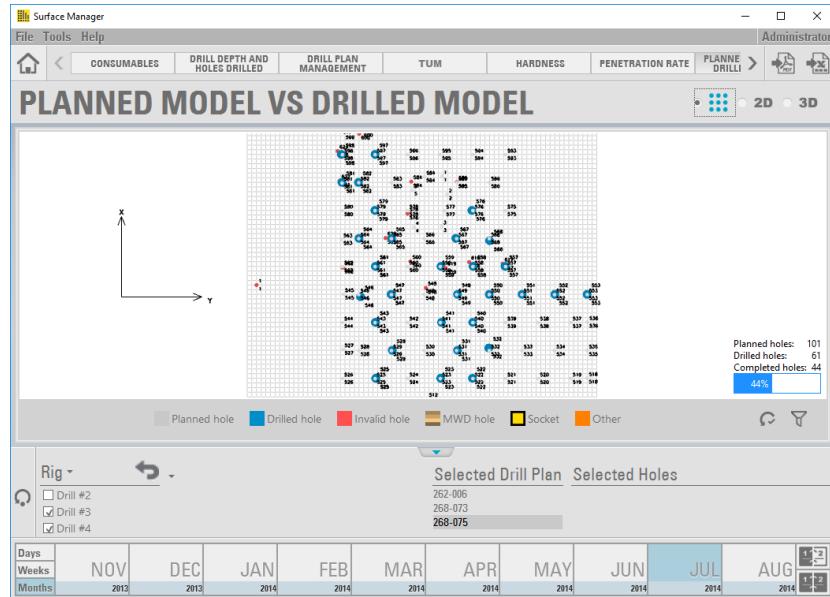
What holes are shown?

The preview shows the latest drilled holes with a matching planned hole, on the currently used drill plan. A maximum number of 50 drill holes are shown.

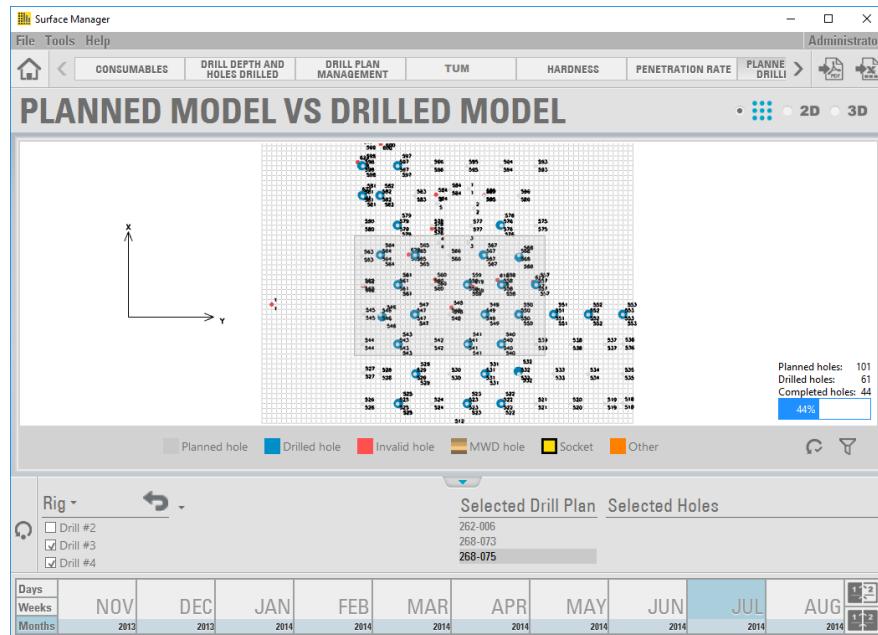
The currently used drill plan is determined by looking up the last drilled hole, and using the drill plan for that hole.

Drill plan view

The Drill plan view shows the overview of a drill plan from a top down perspective.



Click on a drilled hole to select, or multi-select using **Ctrl-click**, or click and drag a selection rectangle.



The selected drill holes will appear in selected the drill holes list.

Selected Holes
X 14... Y 22... Z 34...
X 15... Y 22... Z 34...
X 15... Y 22... Z 34...
X 14 Y 22 Z 34

Where does the hole data come from?

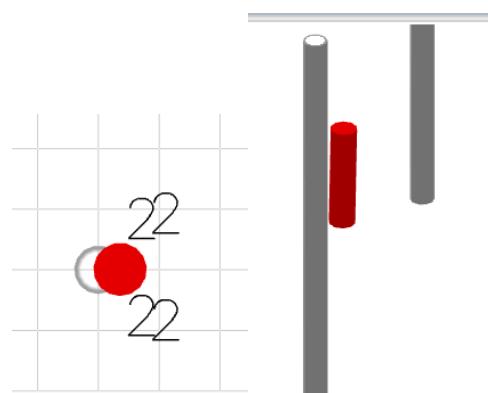
Planned holes are imported from generic text format or Iredes drill plans. Drilled hole information is based on data in quality logs and are mapped with planned holes using hole id.

Measure while drilling hole information, e.g. Rock Hardness, is calculated based on data from MWD logs.

Checking a hole's GPS quality

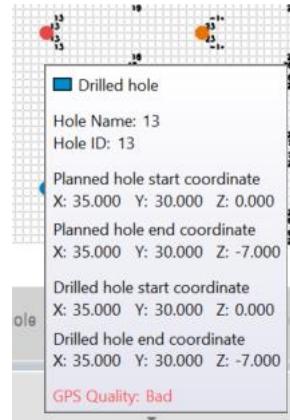
When using the *Hole Navigation System (HNS)* with an Epiroc machine, Surface Manager is able to read the value of the GPS system at the time the hole was started. This is then used to add an extra piece of information to drilled holes which enables the user to quickly see any potential coverage issues or accuracy problems.

Any holes which have a GPS quality which is not considered to be 'good' are drawn in red on the **Planned vs drilled** screens.



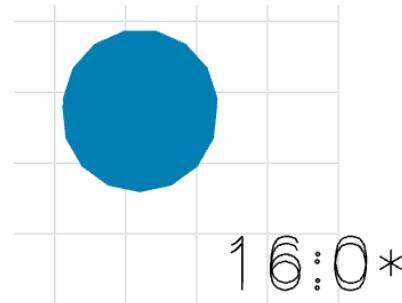
The quality is determined from the system status provided to RCS by the HNS Modules. If the HNS reports anything other than a high precision lock with valid GPS corrections, the hole will be flagged as poor.

The status is also shown in the tooltip of the hole when hovered over with the mouse cursor.

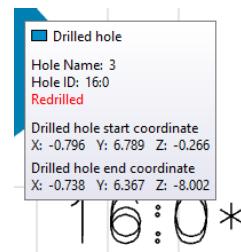


Viewing redrilled holes

It is possible to identify those holes that have been flagged with a redrilled status by observing the asterisk (*) next to the Hole ID on the overview.



Hovering over the hole to view the tooltip will also display a red **Redrilled** tag.



Viewing the Drill plan progression

Located in the bottom right of the top down view is the drill plan progression view. It shows some metrics relating to the completion of the drill plan.

Planned holes: 10

Drilled holes: 2

Completed holes: 2

Redrilled holes: 1

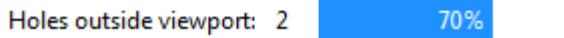


Note: Progression is a percentage defined by how many of the planned holes that have been drilled. If **Drilled holes** has a value larger than expected, it is likely that there are holes drilled which do not map to the drill plan (E.g.: -1, -2).

Holes outside viewport

If the drill plan contains holes that are located more than 3 km away from the drill plan's median point, they will be removed from the viewport. A text will appear showing the number of holes that were not shown.

Planned holes:	10
Drilled holes:	8
Completed holes:	7
Holes outside viewport:	2



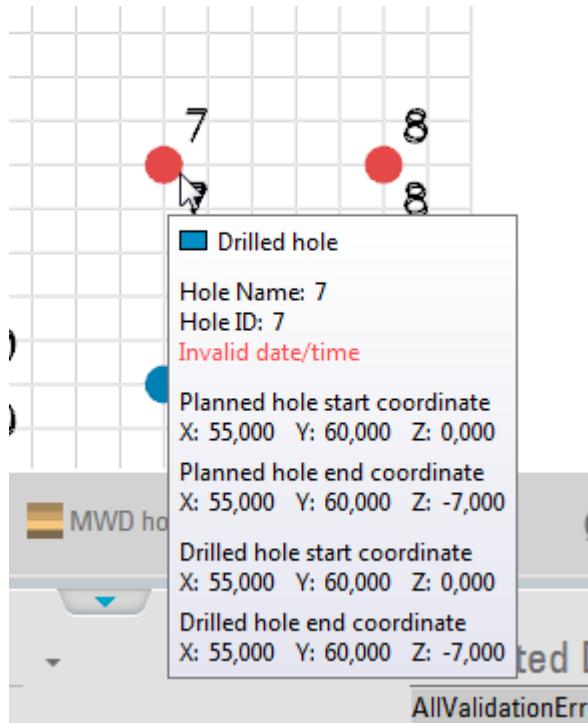
Note: These hidden holes will still show up in reports (Excel and PDF).

Invalid holes

An invalid hole is a drill hole that has a timestamp or position outside the defined normal range. There can be multiple reasons to why; it can be related to operator handling, faulty hardware or machine calibration, to name a few.

Invalid holes are painted in red or orange.

To understand why a hole is colored red or orange, look at the tooltip. In the example below the drill hole has an invalid timestamp.



Invalid hole categories

Category	Color	Description
Duplicate	Orange	Two or more holes in a drill plan have the same hole id and/or hole name, but more than one of those are marked as drilled (and not redrilled).
GPS failure	Red	When the GPS status reported is not good.
Invalid angle	Red	When the vertical angle for a drilled hole exceeds 40 degrees.
Invalid depth	Red	When the drilled distance exceeds the maximum drill depth for the actual machine.
Invalid position	Red	When a planned hole's start or end point is deviating more than one meter, in XY, from the drilled hole.
Invalid time	Red	When a hole's logged end time is before its start time, or if the logged start time is set to "1984-01-01", or if the total time between the logged start and end time exceeds one week.

Time overlapping	Red	There are two or more drilled holes on this pattern that have been drilled the same time, by the same machine serial number.
Unplanned	Orange	When hole name is a number and less than '0', or if hole name is a text and hole id is a number less than '0'.
Upside down	Red	The end position is logged with a greater z value than the start position.

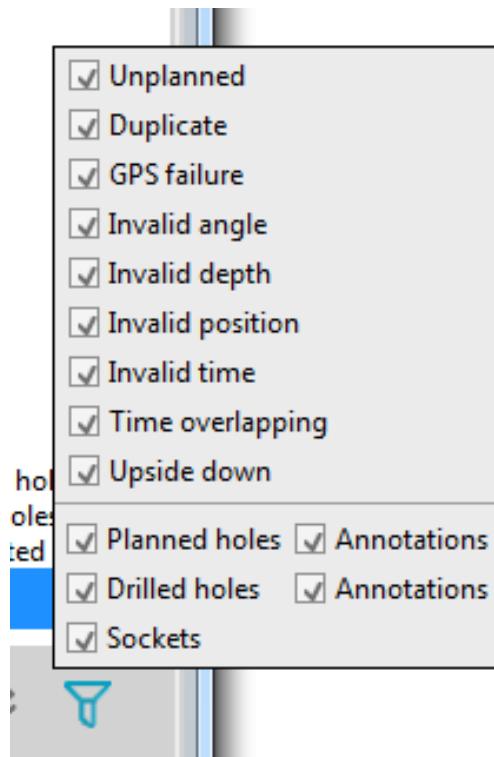
Invalid hole color summary

Red is used to indicate equipment errors, such as GPS Hardware and Faulty Sensors. It could be physical failure, or incorrect calibration.

Orange is used to indicate errors that were more likely caused by an operator through incorrect usage of the machine (e.g. duplicate holes).

Filter for invalid holes

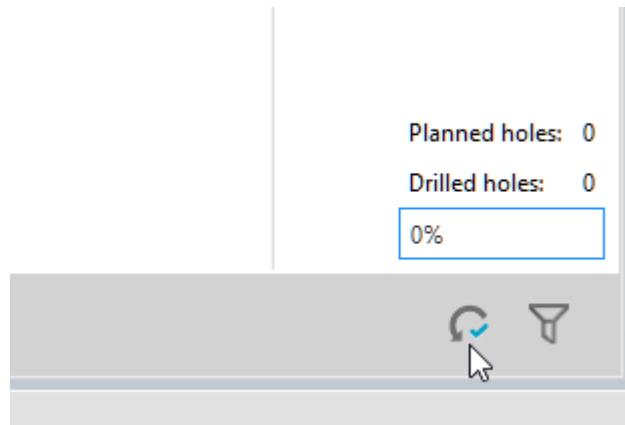
Select the categories of invalid holes to show.



Updating the invalid holes

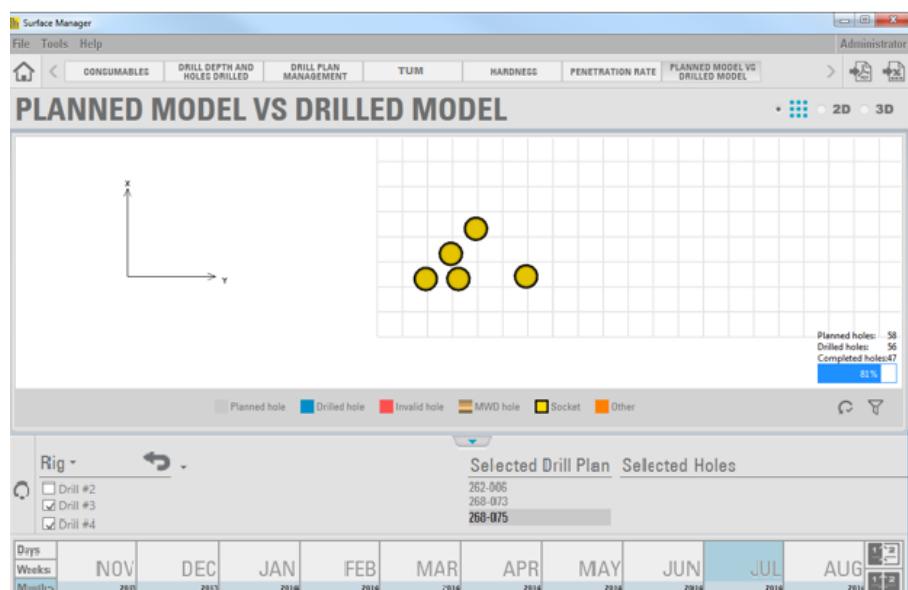
By clicking the revalidate button, all the holes in the drill plan will be revalidated.

Note: This is not something that would be normally required, since when a hole is imported it is validated automatically. It might be required if a machine type is changed, or production data is removed or edited.



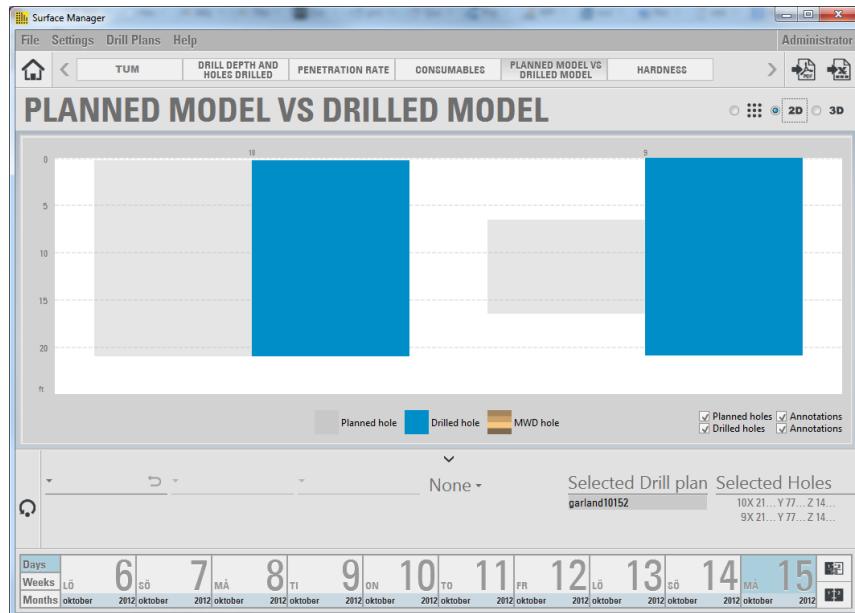
Viewing Sockets

Drill hole sockets are shown in yellow with a black border.



Hole depth view (2D)

The hole depth view shows the holes projected on to the z-axis aligned to the target depth.

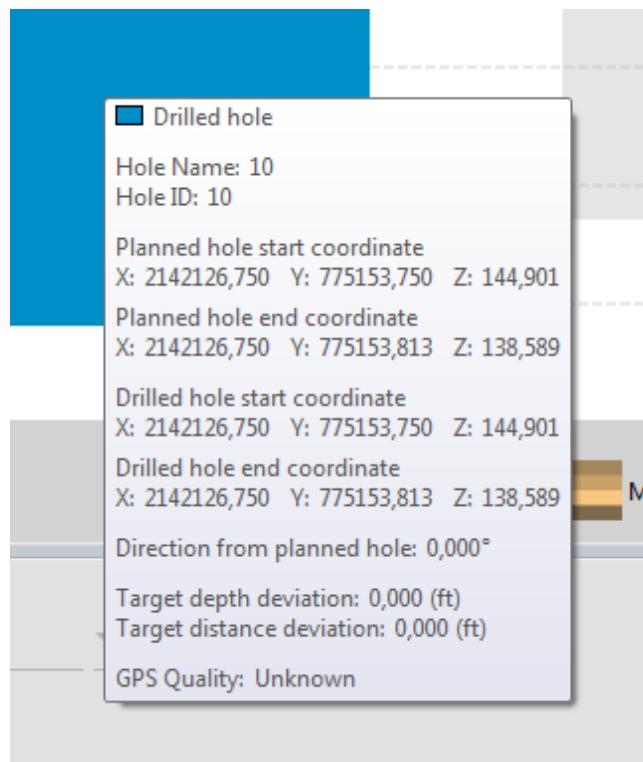


Target depth deviation

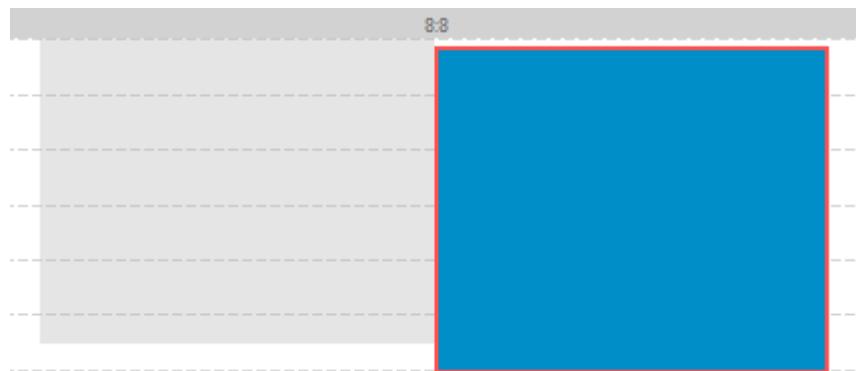
The delta between planned target depth and actual drilled depth is shown in the tooltip for the drilled hole.

Target distance deviation

The delta between planned start point and actual drilled start point is shown in the tooltip for the drilled hole.



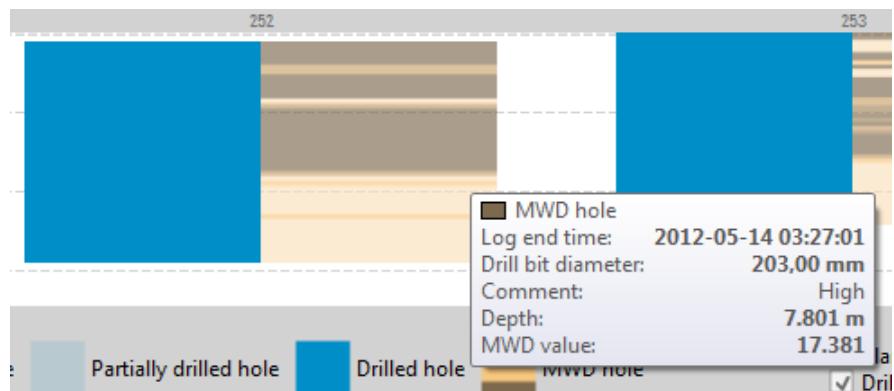
A hole with a target depth deviation or distance deviation greater than allowed will be marked with a red border.



Note: To edit the hole depth deviation limit and distance deviation limit, see page 146.

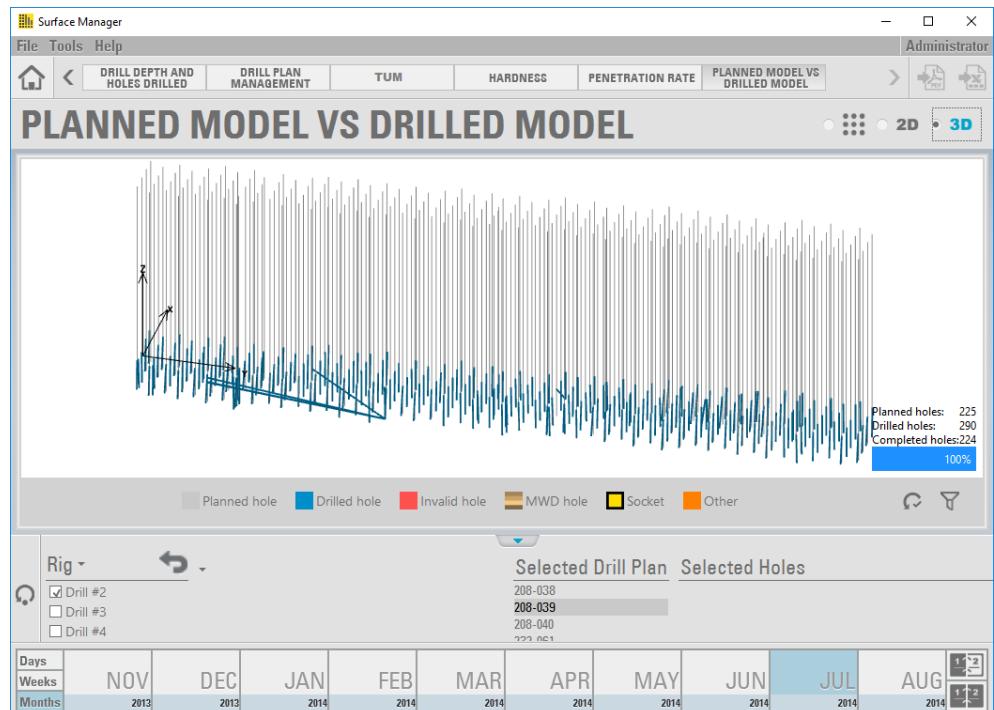
MWD information

Select MWD parameter to show parameter values in a certain depth. Tooltip shows detailed information.



3D view

The 3D view shows the drilled holes relative to each other in real world space.



Use the mouse to navigate:

Press and hold left mouse button to rotate view.

Press and hold right mouse button to move view.

Reporting

Select the desired report by clicking the Excel or PDF icon.

How to build a query

To filter the query, make sure the desired calendar range is set. Start by selecting operator, drill plan or shift.

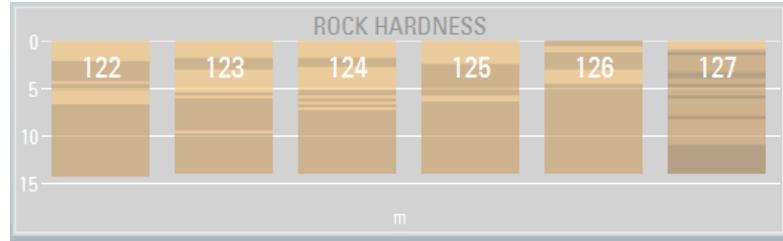
Continue to add filter until satisfied. To undo a filter click undo icon. The drill plans used shows up to the right.

Select a drill plan from the list.

Rock hardness widget

Preview

The preview shows the latest drilled holes with rock hardness values. The colors represent the rock hardness and the labels represent the drill hole id.

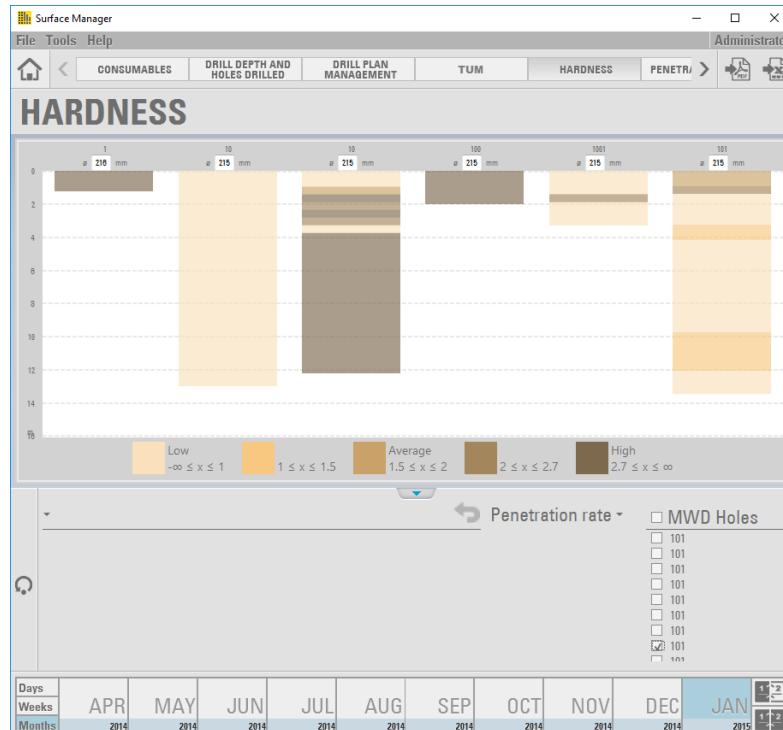


What is the Rock Hardness?

The rock hardness is measured by how much energy is needed to drill into the rock, in N cm / cm³. Uses MWD logs and drill bit diameter from drilled hole, planned or default.

MWD view

The MWD view shows the MWD sample values for the selected holes at a certain depth. You can select/deselect all holes with the checkbox at the top.



How are the MWD data visualized?

The MWD logs contain values at a certain depth. Caution must be taken when comparing values at a certain depth, because the holes might not be in parallel.

Default drill bit diameter

The drill bit diameter is essential for the rock hardness calculation. When drill bit diameter is missing in logs from the drill, the default drill bit diameter is used.

Note: To edit the default drill bit diameter, see page 146.

Set the default drill bit diameter. Click **OK**.

Reporting

Select the desired report by clicking the Excel or PDF icon.

How to build a query

To filter the query, make sure the desired calendar range is set.

Start by selecting the Operator, Drill plan, or Shift.

Continue to add filter until satisfied.

To undo a filter click the **Undo** icon.

The MWD data for drilled holes shows up to the right.

Select the MWD holes.

Log files import

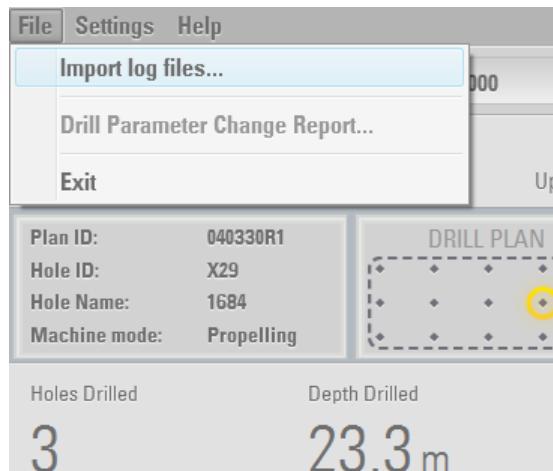
Automatic log file import

When running with a server database setup, the log files can be automatically imported. See the *Surface Manager Server User's Guide*.

Manual log file import

Manual log file import is only available when using a local database.

Open the **File> Import log files** menu.



Select a folder.

The log files residing in that folder will be imported.

The dashboard will be automatically updated.

Drill plan import

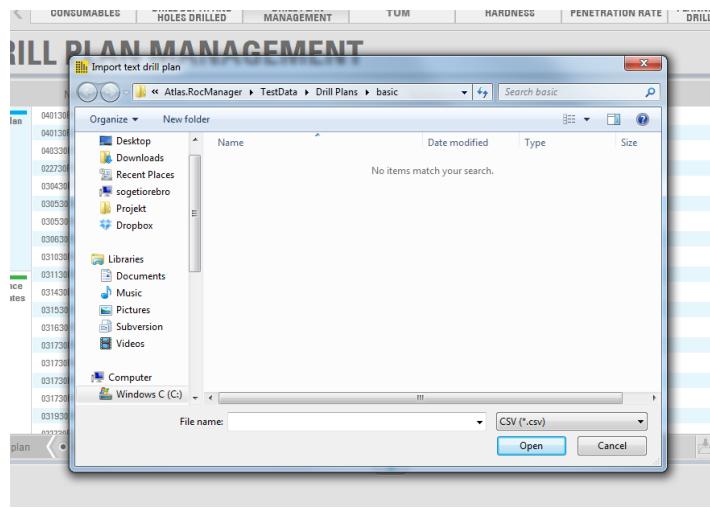
Drill plan import

The screenshot shows the 'DRILL PLAN MANAGEMENT' section of the Surface Manager application. The interface includes a navigation bar with 'File', 'Tools', and 'Help' tabs, and a user 'Administrator'. Below the navigation is a toolbar with icons for 'CONSUMABLES', 'DRILL DEPTH AND HOLES DRILLED', 'DRILL PLAN MANAGEMENT' (which is selected), 'HARDNESS', 'PENETRATION RATE', and PDF export. A sidebar on the left lists categories: 'Drill plan', 'Geofence Templates', 'Hazard Templates', and 'Sockets'. The main area displays a table with columns: Name, Created, Modified, Author, and Autonomous. The 'Autonomous' column contains checkboxes, with the first one checked. The table lists numerous drill plans, such as '_demo', '60', '178-001', etc., with their respective details like creation and modification dates and authors.

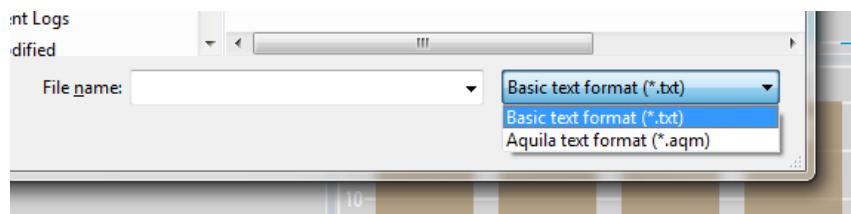
Open the Drill Plan Management widget.

Click Import.





Select a file matching the selected drill plan text format.



Note: See [Text Formats](#), page 131, for information about how to create a custom text format.

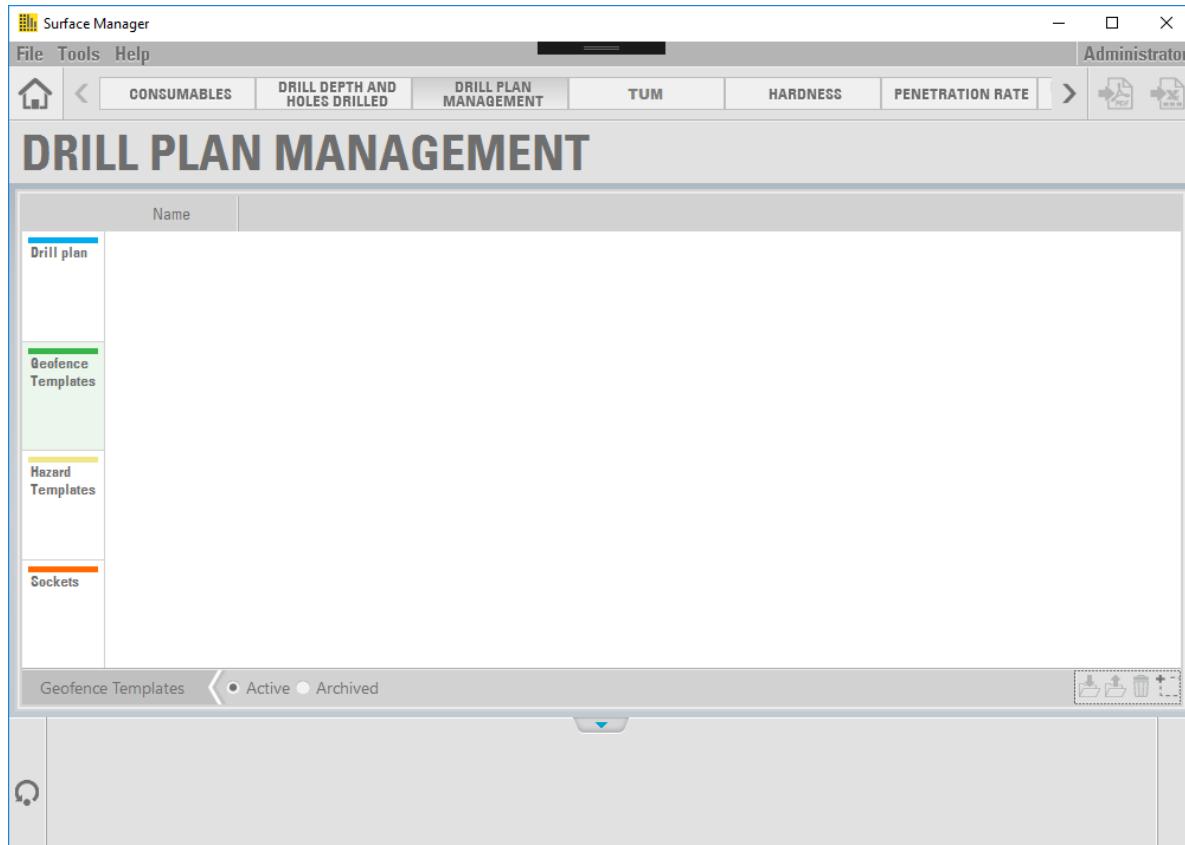
[In the case of exporting to Pit Viper equipment, special characters are permitted in the name of a drill plan.](#)

[In case of exporting to SmartROC equipment, drill plan names can only have a-z, A-Z, 0-9, _ . For mixed fleets, special characters should not be used when naming drill plans.](#)

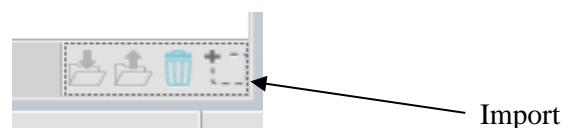
Geofence template import

Geofence template import

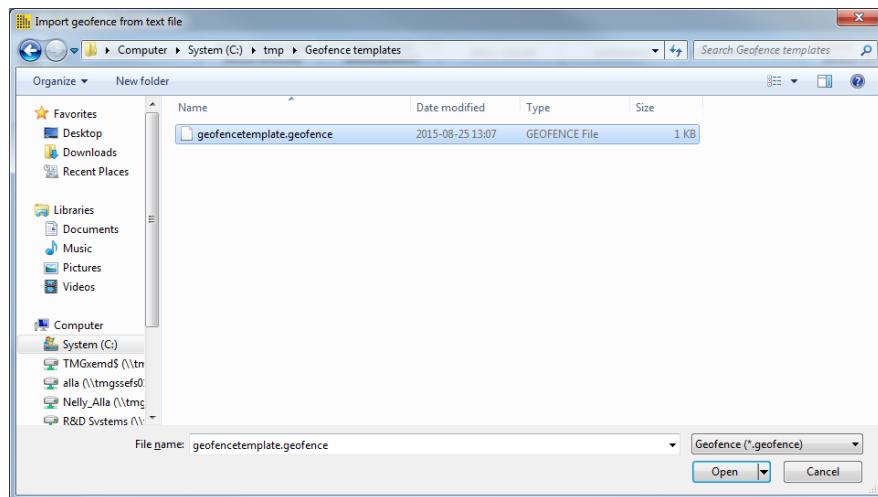
Open the Drill Plan Management widget and select the **Geofence templates** tab.



Click the Import icon in the bottom right corner



Select a file matching the geofence template text format and click **Open**.



Geofence template text format

The text files must have the following format:

Row number	Description
1	Header row. This row will be ignored in the parsing, but must contain at least one character.
2...n	Points in the geofence. One point per row that specifies X and Y coordinates separated with comma. E.g. 10, 12 will generate a point with X=10 and Y=12.

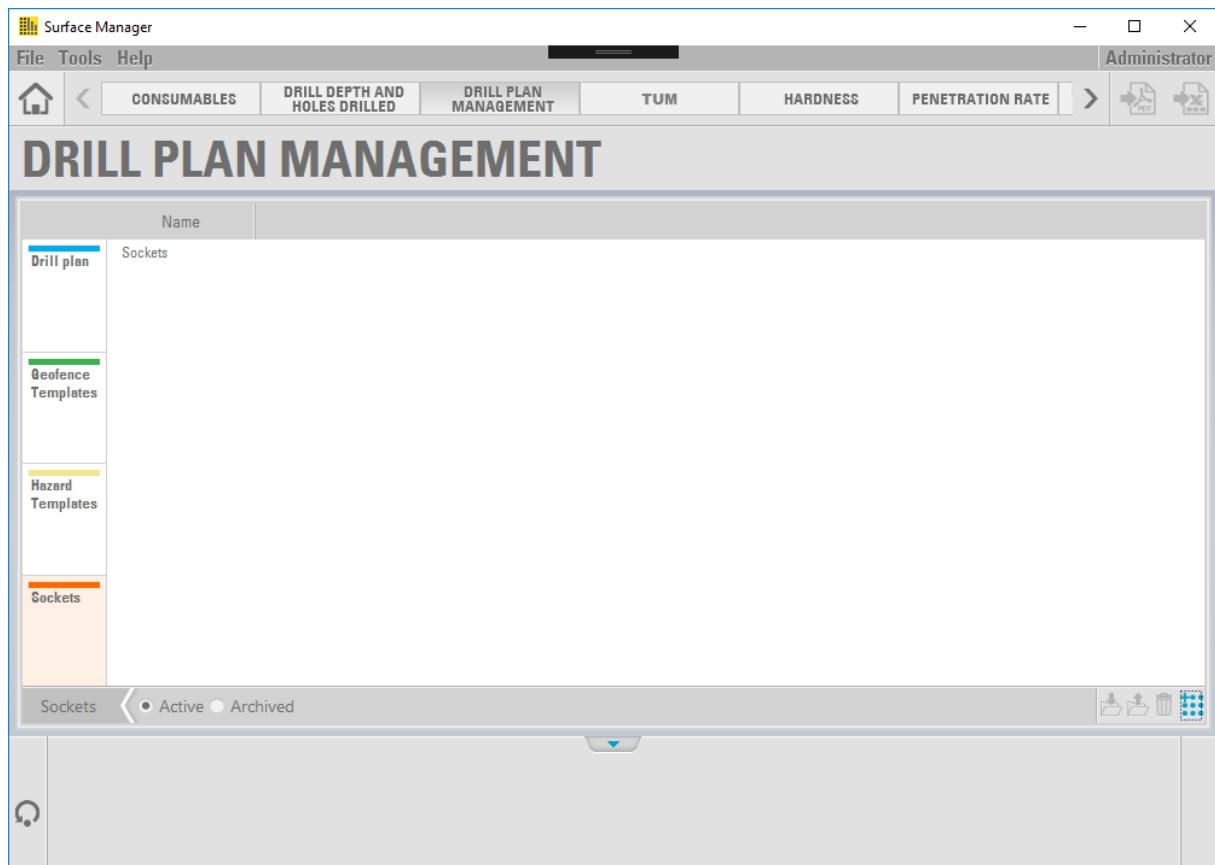
Example of geofence template file content:

```
X,Y - put any text here
10,20
30,30
30,50
20,60
```

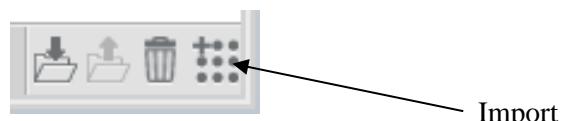
Sockets template import

Sockets template import

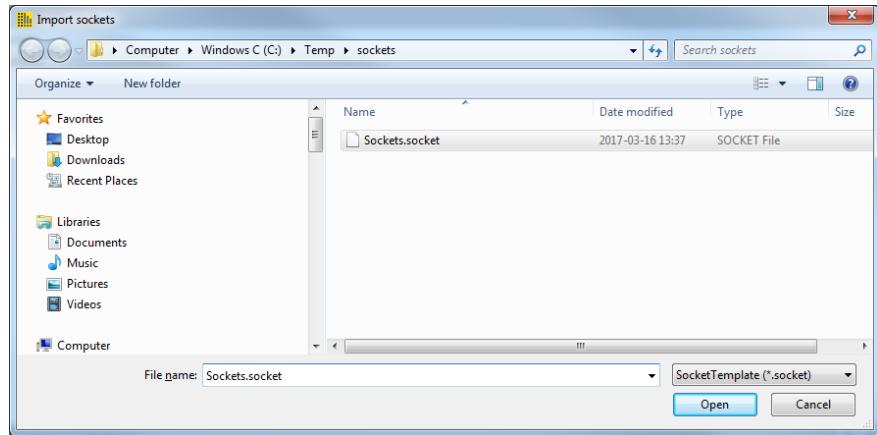
Open the Drill Plan Management widget and select the **Sockets** tab.



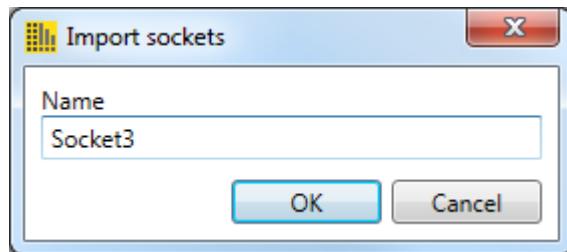
Click the Import icon in the bottom right corner.



Select a file matching the sockets template text format and click **Open**.



Enter a file name for the drill hole socket template and click **OK**.



Socket template text format

The text files must have the following format:

Row number	Description
1	Header row. This row will be ignored in the parsing, but must contain at least one character.
2...n	Socket coordinates. One point per row that specifies X and Y coordinates for the sockets, separated with comma. E.g. 10, 12 will generate a point with X=10 and Y=12.

Row number Description

1	Header row. This row will be ignored in the parsing, but must contain at least one character.
2...n	Socket coordinates. One point per row that specifies X and Y coordinates for the sockets, separated with comma. E.g. 10, 12 will generate a point with X=10 and Y=12.

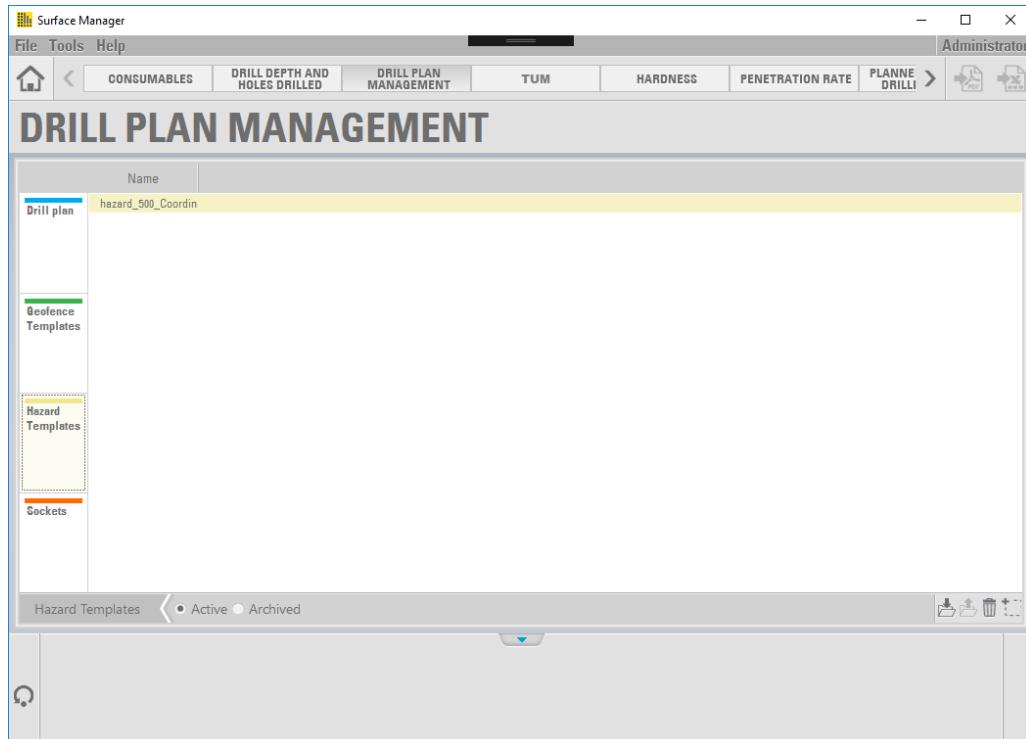
Example of socket template file content:

```
X,Y - put any text here  
10,20  
30,30  
30,50  
20,60
```

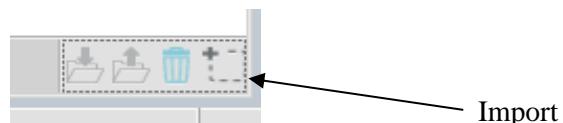
Hazard template import

Hazard template import

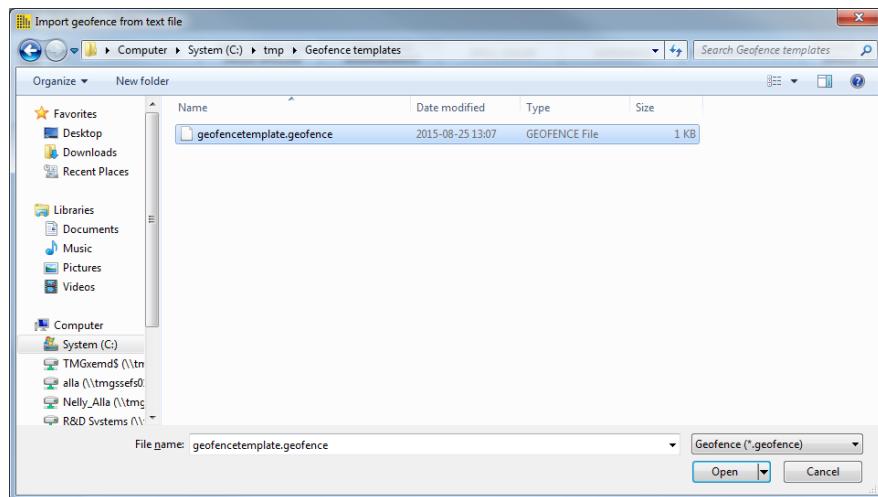
Open the Drill Plan Management widget and select the **Hazard templates** tab.



Click the Import icon in the bottom right corner



Select a file matching the geofence template text format and click **Open**.



Hazard template text format

The text files must have the following format:

Row number	Description
1	Header row. This row will be ignored in the parsing, but must contain at least one character.
2...n	Points in the hazard. One point per row that specifies X and Y coordinates separated with comma. E.g. 10, 12 will generate a point with X=10 and Y=12.

Row number	Description
1	Header row. This row will be ignored in the parsing, but must contain at least one character.
2...n	Points in the hazard. One point per row that specifies X and Y coordinates separated with comma. E.g. 10, 12 will generate a point with X=10 and Y=12.

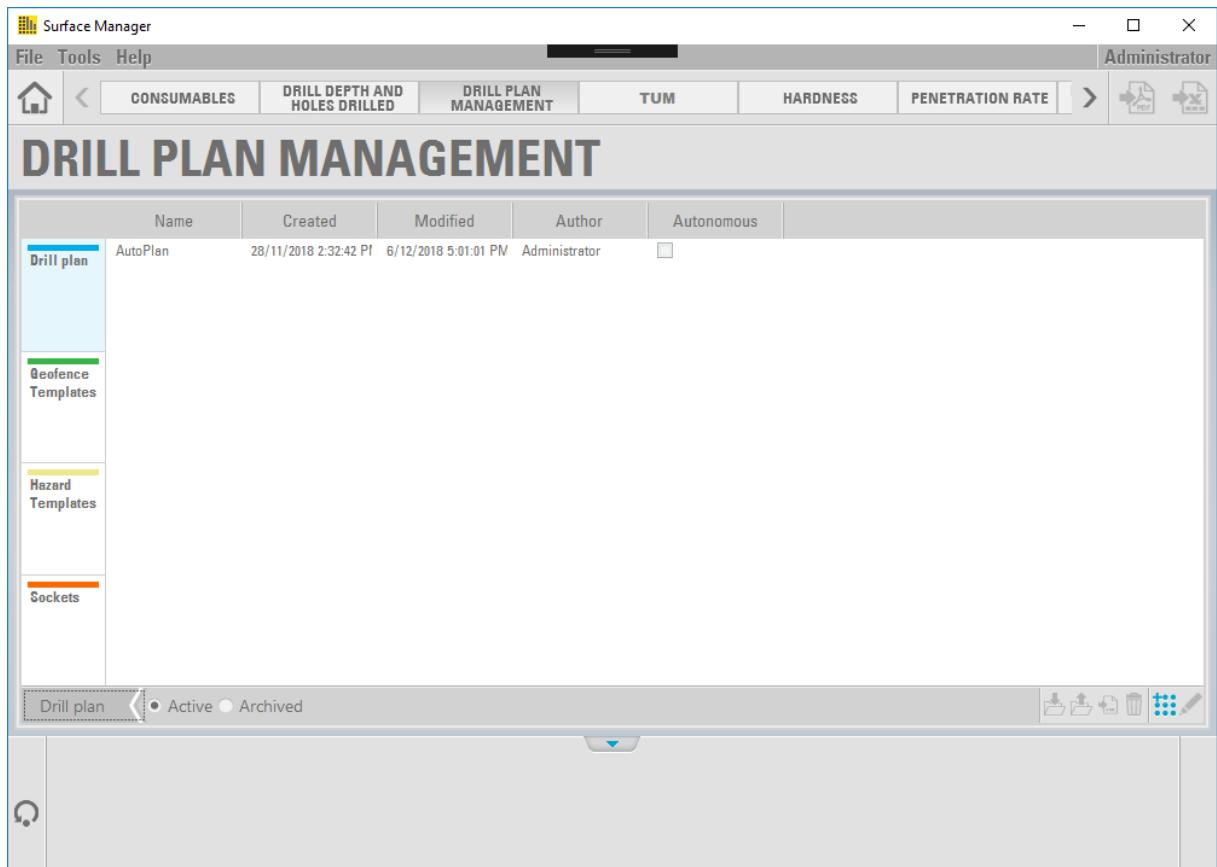
Example of hazard template file content:

```
X,Y - put any text here  
10,20  
30,30  
30,50  
20,60
```

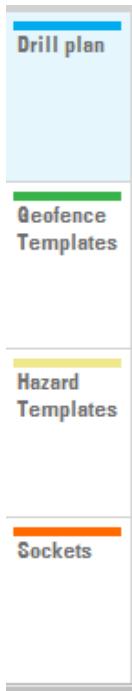
Drill plan, geofence, hazard and sockets template archive

Archive

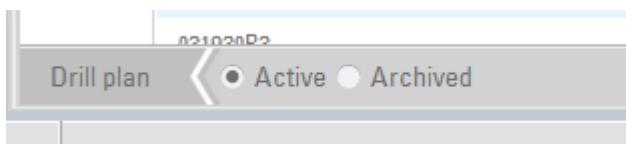
Open the Drill Plan Management widget.



Select the **Drill plan**, **Geofence templates**, **Hazard templates** or **Sockets** tab.



Select **Active**.



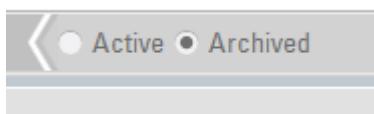
The active drill plans/geofence templates/hazard templates/sockets are listed.

Press the **Archive** icon to add a drill plan, geofence template, hazard template or sockets template to the archive.

Note: You need to have read/write privileges to archive.

Unarchive

Select **Archived**.

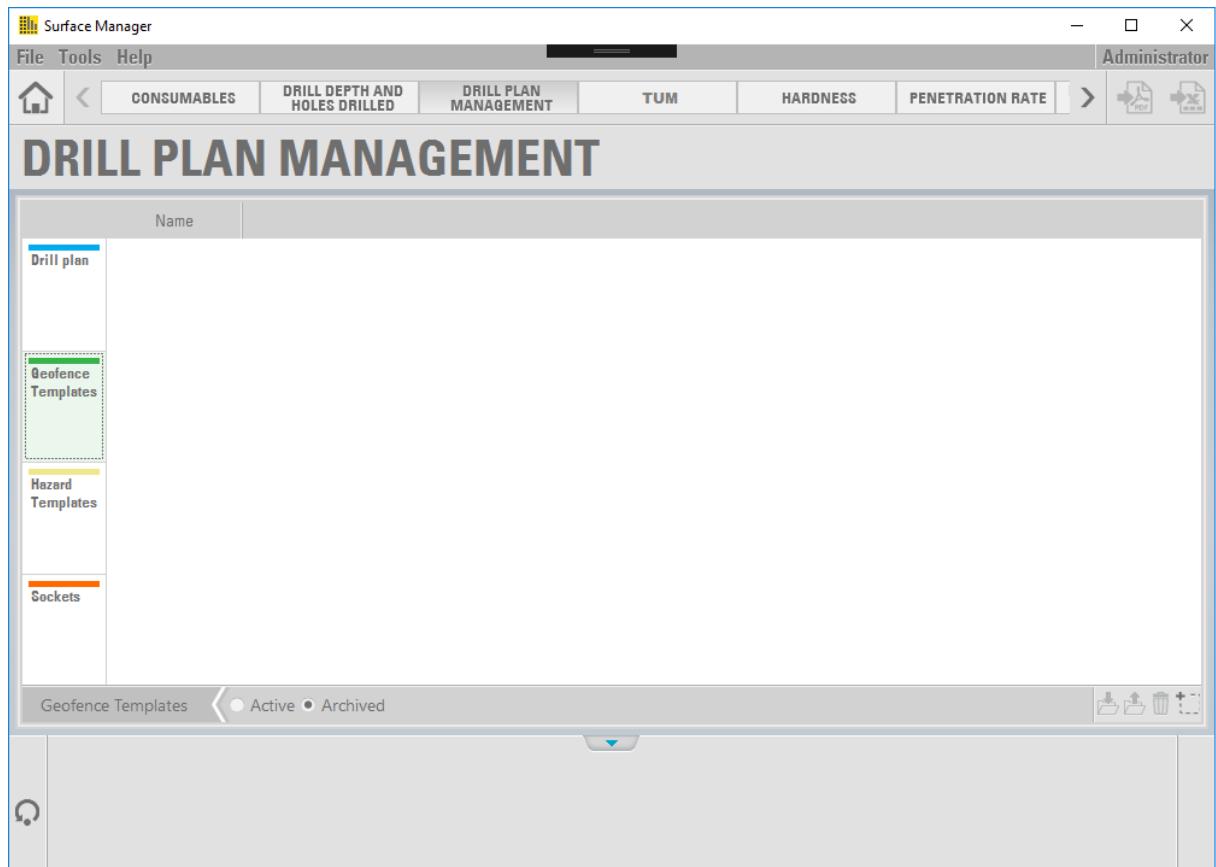


Press the **Unarchive** icon to bring back a drill plan, geofence template, hazard template or sockets template from the archive.

Note: You need to have read/write privileges to unarchive.

Delete

From the Drill Plan Management widget, select a drill plan, geofence template, hazard template or sockets template.



Click the **Delete** icon to permanently delete a drill plan, geofence template, hazard template or sockets template.

Note: When drill plan is deleted all associated information, including drill hole data, is deleted from the database as well.

You need to have administrator privileges to delete.

Drill Parameter Change Report

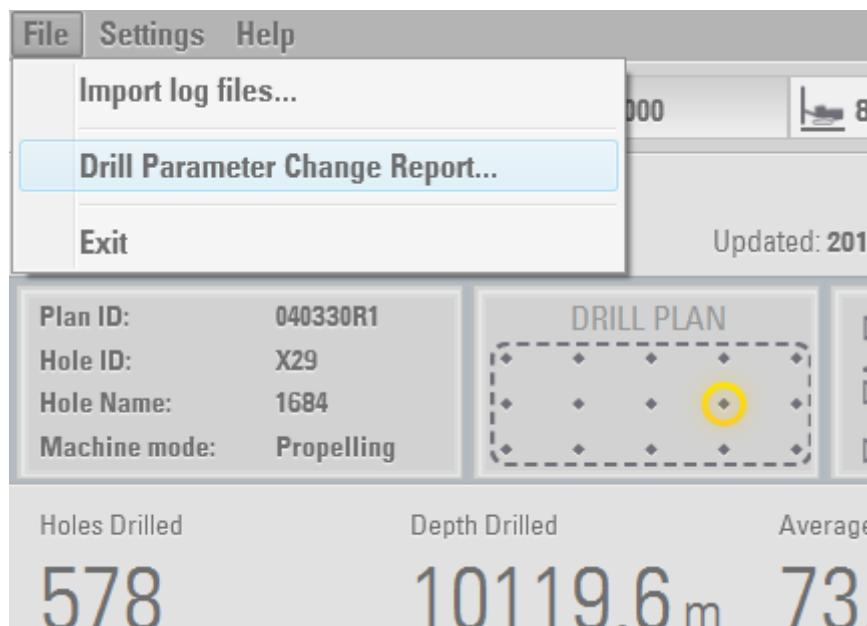
Create report

To build a report:

The user must select the time period from the bottom of the main dashboard (day, week, month, or custom using the calendar popup).



Open the **File > Drill Parameter Change Report...** menu



A PDF is created; sorted by USB and then by machine.

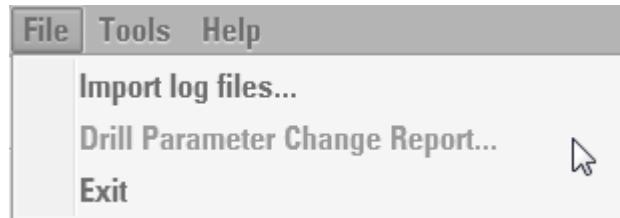
Drill Parameter Changes					
2013-03-01 - 2013-03-02					
USB (N/A)					
Drill Name: 8999804700 Drill Serial #:8999804700					
Date	Time	Menu ID	Parameter	Old Value	New Value
2013-03-01	07:42:10	D0:0	Allow USB login security	False	True
2013-03-01	07:45:46	D0:0	Use automatic rod support handling	False	True
2013-03-01	07:45:47	D0:0	Use automatic rod support handling	True	False

The report shows the time stamp, menu ID, parameter name, previous and new value of the parameter change.

Feature activation

Drill Parameter Change Report feature becomes active when Surface Manager has detected event logs containing USB Security changes.

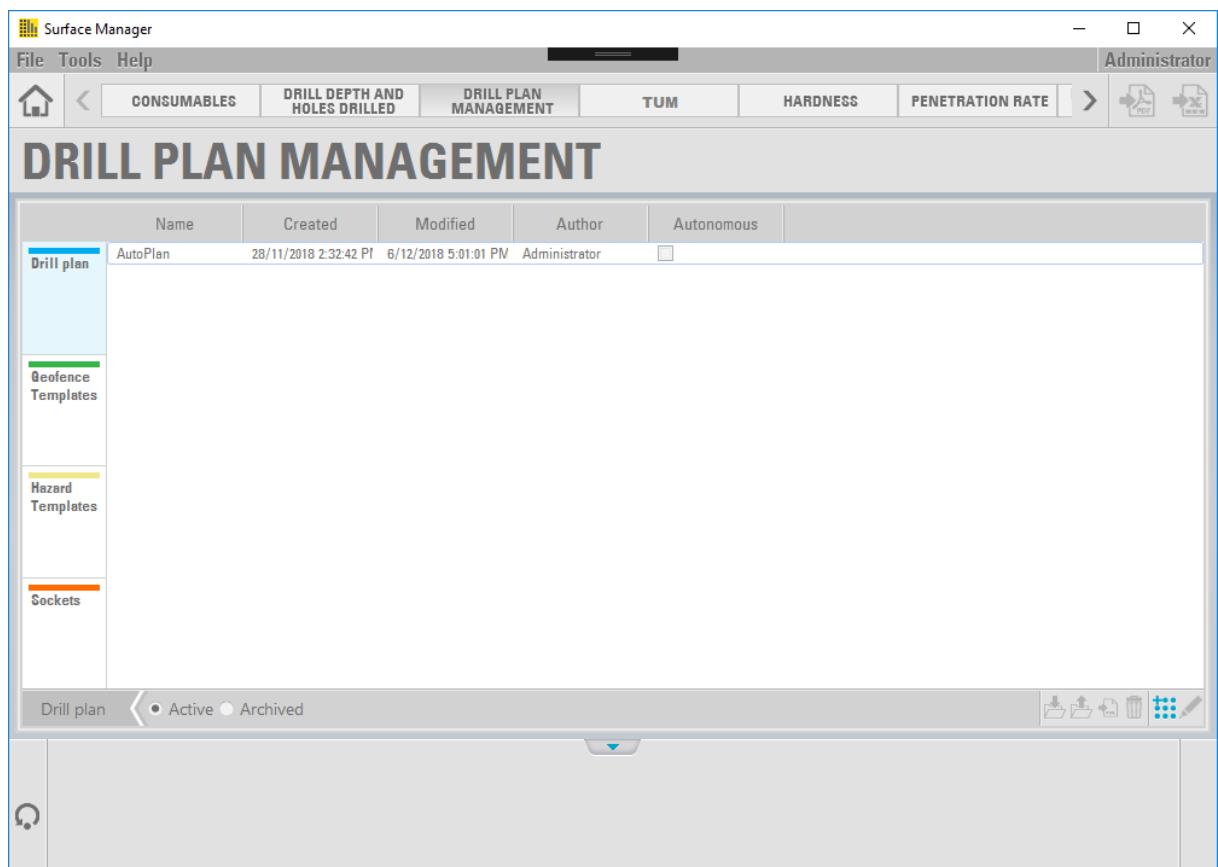
The **Drill parameter change report...** will at that point change from being greyed out enabled.



Drill plan export

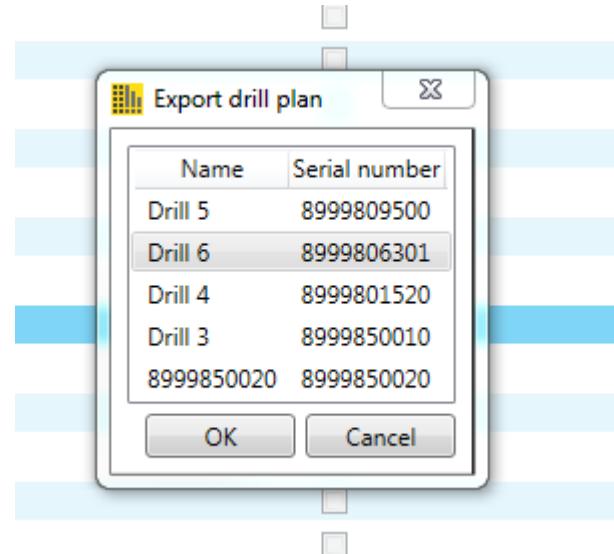
Export drill plan to rig using RRA

Open the Drill Plan Management widget.



Select a drill plan.

Click export drill plan to machine .



Select the machine to export the drill plan to.

Click **OK**.

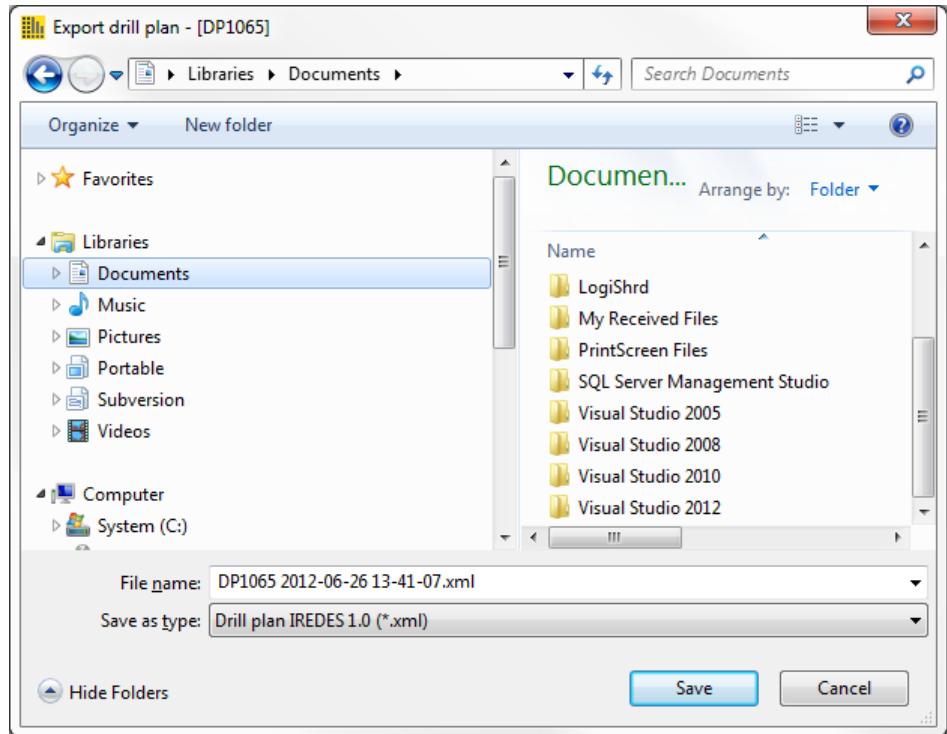
The drill plan will be exported to the selected machine's specified export folder (typically "To" folder in RRA server).

Surface Manager must be using the central database setup for this to work.

Manual export of drill plan

Click export drill plan to file .

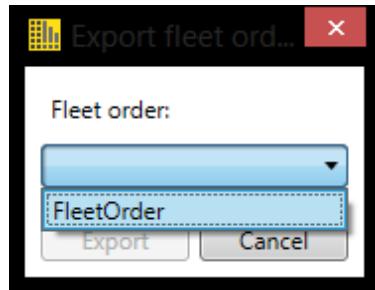
Select a location for the drill plan file.



Click **Save** to save the drill plan.

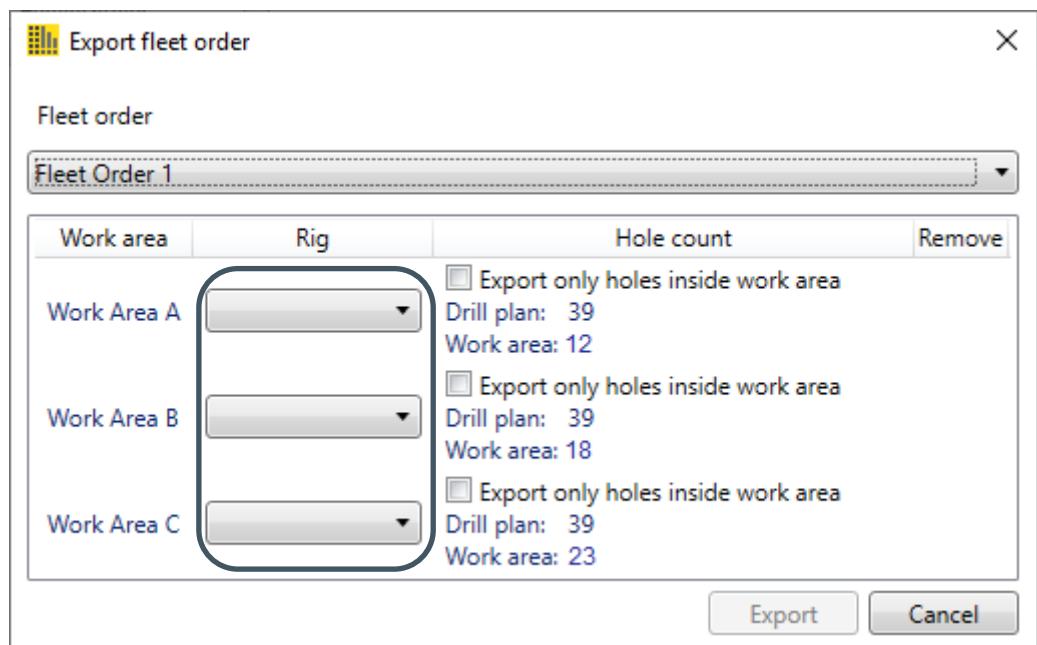
Fleet order export

The procedure to export a drill plan with fleet orders is similar to that of exporting the drill plan, however the popup window shown after clicking on export to machine shows the fleet orders defined on the drill plan.

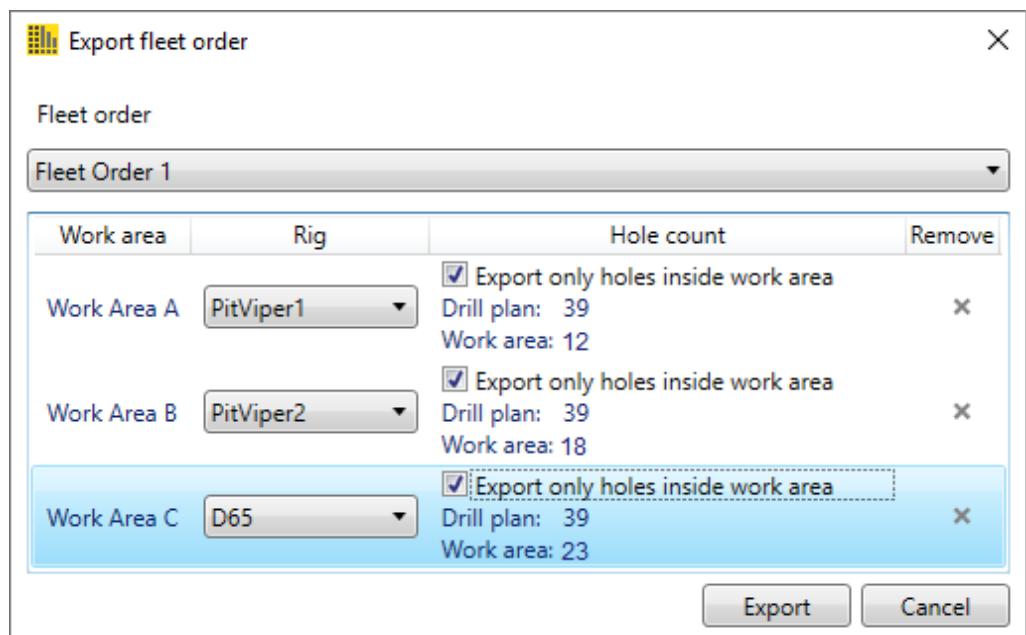


Select the fleet order to be exported, and a list of the work areas is shown.

Assign each work area to a machine.



Drop down boxes allow you to choose which machine each of these will be sent to.



If *Export only holes inside work area* is not enabled, the full drill plan will be exported to the rig. When all the work areas have been assigned, click **Export**.

When **Export** is clicked, the individual files will be generated and placed into the defined RRA folders on the Surface Manager Server, waiting to be transferred to the drills.

Production Editor

The **Production Editor** is a retrospective data validation tool which can be used by approved users to manipulate data on drilled holes.

It is possible to edit and delete drilled holes from the production data.

All changes are tracked in the database, providing a history that could be investigated by a system administrator should malicious or accidental data corruption occur.

Rigs	Drill plans	Start date	Tuesday, December 31, 2013 6:00:00 AM	End date	Saturday, June 25, 2016 5:59:59 AM	Refresh	<input type="checkbox"/> Holes with validation errors				
Drill #2		Hole Id	Hole Name	Drill Plan	Rig	GPS Quality	Start Time	End Time	Start Coordinate	End Coordinate	Length (m)
Drill #3		5	256-124	8999476400	Good		12/31/2013 8:22:36 AM	12/31/2013 8:42:30 AM	X: 5540725.9, Y: 59141	X: 5540725.9, Y: 59141	13.305
Drill #4		4	256-124	8999476400	Good		12/31/2013 6:56:28 AM	12/31/2013 7:11:32 AM	X: 5540726, Y: 59147	X: 5540726, Y: 59141	13.608
Drill #5		3	256-124	8999476400	Good		12/31/2013 7:24:30 AM	12/31/2013 7:37:52 AM	X: 5540726.5, Y: 59141	X: 5540726.5, Y: 59147	13.578
Drill #6		2	256-124	8999476400	Good		12/31/2013 7:41:18 AM	12/31/2013 8:01:01 AM	X: 5540726, Y: 591481	X: 5540722, Y: 591481	13.497
Drill #7		1	256-124	8999476400	Good		12/31/2013 8:31:06 AM	12/31/2013 8:39:44 AM	X: 5540727, Y: 59141	X: 5540728, Y: 59141	14.085
Drill #8		8	256-124	8999476400	Good		12/31/2013 9:24:39 AM	12/31/2013 9:45:00 AM	X: 5540725, Y: 59141	X: 5540726, Y: 591439	14.224
Drill #9		281	244-84	8999476400	Good		1/5/2014 12:18:33 PM	1/5/2014 12:18:58 PM	X: 5540813.5, Y: 59141	X: 5540814.5, Y: 59141	15.57
PitViper 1		106	244-84	8999476400	Good		1/5/2014 12:14:07 AM	1/5/2014 12:14:39 AM	X: 5540938.5, Y: 59171	X: 5540938.5, Y: 59171	2.49
PitViper 2		106	244-84	8999476400	Good		1/5/2014 12:45:00 AM	1/5/2014 12:45:38 AM	X: 5540938.5, Y: 59171	X: 5540937.5, Y: 59171	14.024
PitViper 3		107	244-84	8999476400	Good		1/5/2014 12:25:26 AM	1/5/2014 12:25:25 AM	X: 5540928.5, Y: 59171	X: 5540928.5, Y: 59171	2.478
PitViper 4		107	244-84	8999476400	Good		1/5/2014 12:23:27 AM	1/5/2014 12:26:05 AM	X: 5540928.5, Y: 59171	X: 5540930.5, Y: 59171	14.283
Diamond 5		108	244-84	8999476400	Good		1/5/2014 1:23:50 AM	1/5/2014 1:23:55 AM	X: 5540921.5, Y: 59171	X: 5540921.5, Y: 59171	2.249
		108	244-84	8999476400	Good		1/5/2014 1:33:19 AM	1/5/2014 2:08:39 AM	X: 5540921.5, Y: 59171	X: 5540922, Y: 59171	14.491
		109	244-84	8999476400	Good		1/5/2014 2:15:59 AM	1/5/2014 2:18:20 AM	X: 5540914.5, Y: 59171	X: 5540914.5, Y: 59171	2.302
		109	244-84	8999476400	Good		1/5/2014 2:18:34 AM	1/5/2014 2:42:51 AM	X: 5540914.5, Y: 59171	X: 5540915, Y: 59171	14.338
		110	244-84	8999476400	Good		1/5/2014 2:51:07 AM	1/5/2014 2:51:40 AM	X: 5540907.5, Y: 59171	X: 5540907.5, Y: 59171	2.528
		110	244-84	8999476400	Good		1/5/2014 2:51:41 AM	1/5/2014 3:21:23 AM	X: 5540908.5, Y: 59171	X: 5540908.5, Y: 59171	14.533
		111	244-84	8999476400	Good		1/5/2014 3:23:13 AM	1/5/2014 3:23:55 AM	X: 5540909.5, Y: 59171	X: 5540909.5, Y: 59171	2.077

View events

The main screen of the *Production editor* lists all drilled holes between the selected dates. The main view enables filtering of machine and drill plan to assist the user in finding the exact drilled hole they need to view or adjust.

Click **Refresh** to refresh the list.

To open an item for editing double click on it in the list. You can also select an item and click the **Edit** button.

Filter by rig

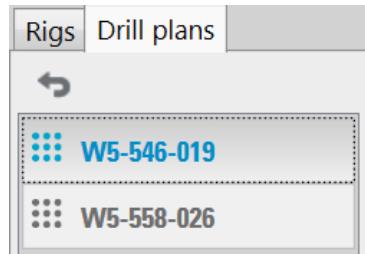
To filter the drilled hole list by machine, select the **Rigs** tab and click the machine name in the list. The currently active machine filter will be displayed in blue.



Clicking the back arrow will clear the active filter.

Filter by drill plan

To filter the drilled hole list by drill plan, select the *Drill plans* tab and click the drill plan name in the list. The currently active drill plan filter will be displayed in blue



Clicking the back arrow will clear the active filter

Filter validation errors

Check the checkbox *Holes with validation errors* to see list of holes only with validation errors

Export drill plan hole change log

To export an excel document with all hole changes registered on a certain drill plan, select a drill plan in the drill plan filter and click the export change log button.



Select a folder and enter a name. The default name is the drill plan name and the current date and time.

Click the save button to generate the report. It will be opened automatically if the export succeeds; otherwise an error message is displayed.

Edit drilled hole

To edit a drilled hole, double click on the hole in the list. The editing window will open. You can also select a hole and click on the edit button.

Name	30
Start time	den 28 september 2017 01:24:15
End time	den 28 september 2017 01:40:23
Start coordinate	X 83415,69 Y 10282,967 Z 558,086
End coordinate	X 83415,842 Y 10283,124 Z 545,975
Length	m 12,113
Drill bit diameter	mm 250
Hole status	Redrilled
Comment	Value is mandatory

Adjust the data to correct values, enter a comment and click *OK* to save it. Clicking *Cancel* will abort the editing without changing any values.

Delete drilled hole

To permanently delete a drilled hole, select the hole and click the delete button on the toolbar. Enter a comment and click *OK*.



Show validation errors

If a hole has validation errors you can view the active errors by hovering the mouse cursor over the validation error cell.

	Validation Errors	Edited
Yes	-	

Event editor

The *Event editor* is a retrospective data validation tool which can be used by approved users to manipulate machine events which were created through operator interactions.

It is possible to *add*, *edit*, and *delete* events from the production data under the categories of TUM codes, operator logins and consumable changes.

All changes are tracked in the database, providing a history that could be investigated by a systems administrator should malicious or accidental data corruption occur.

Event Editor							
Rigs	Start date	Wednesday, 1 January, 2014 13:12:15	End date	Friday, 15 August, 2014 13:12:15	Refresh		
8999479200	DRILL #2	TurnCode	1/1/2014 6:27:37 PM	1/1/2014 6:46:09 PM	drilling	OperatingDelay	-
8999480900	DRILL #2	OperatorLogin	1/1/2014 9:05:39 PM		CACTUS3000022916	NA	-
8999801400	DRILL #2	TurnCode	1/1/2014 9:26:06 PM	1/1/2014 11:05:58 PM	drilling	OperatingDelay	-
8999804700	DRILL #2	OperatorLogin	1/1/2014 10:14:14 PM		NA	NA	-
8999864880	DRILL #2	TurnCode	1/1/2014 11:40:45 PM	1/2/2014 12:53:45 AM	drilling	OperatingDelay	-
8999910000	DRILL #2	TurnCode	1/2/2014 12:59:04 AM	1/2/2014 12:59:04 AM	drilling	OperatingDelay	-
8999910890	DRILL #2	TurnCode	1/2/2014 3:50:40 AM	1/2/2014 4:18:01 AM	drilling	OperatingDelay	-
8999999990	DRILL #2	TurnCode	1/2/2014 5:05:25 AM	1/2/2014 5:22:34 AM	drilling	OperatingDelay	-
DRILL #2	DRILL #2	TurnCode	1/2/2014 5:28:38 AM	1/2/2014 5:30:03 AM	drilling	OperatingDelay	-
DRILL #3	DRILL #2	TurnCode	1/2/2014 5:50:04 AM	1/2/2014 6:31:06 PM	drilling	OperatingDelay	-
DRILL #4	DRILL #2	TurnCode	1/2/2014 6:31:04 PM	1/2/2014 6:31:05 PM	drilling	OperatingDelay	-
DRILL #5	DRILL #2	TurnCode	1/2/2014 12:59:44 AM	1/2/2014 12:59:57 AM	drilling	OperatingDelay	-
DRILL #6	DRILL #2	TurnCode	1/2/2014 1:37:30 AM	1/2/2014 2:10:54 AM	drilling	OperatingDelay	-
DRILL #7	DRILL #2	TurnCode	1/2/2014 2:15:15 AM	1/2/2014 2:44:52 AM	drilling	OperatingDelay	-
DRILL #8	DRILL #2	TurnCode	1/2/2014 2:46:53 AM	1/2/2014 3:22:45 AM	drilling	OperatingDelay	-
Events	DRILL #2	TurnCode	1/2/2014 3:26:25 AM	1/2/2014 4:01:12 AM	drilling	OperatingDelay	-
TUM Codes	DRILL #2	TurnCode	1/2/2014 4:07:36 AM	1/2/2014 4:48:30 AM	drilling	OperatingDelay	-
Operator Logins	DRILL #2	TurnCode	1/2/2014 4:49:57 AM	1/2/2014 5:27:42 AM	drilling	OperatingDelay	-
Consumables	DRILL #2	TurnCode	1/2/2014 6:01:15 PM	1/2/2014 6:37:56 PM	drilling	OperatingDelay	-
	DRILL #2	TurnCode	1/2/2014 6:42:47 PM	1/2/2014 7:13:10 PM	drilling	OperatingDelay	-
	DRILL #2	TurnCode	1/2/2014 7:14:56 PM	1/2/2014 7:43:06 PM	drilling	OperatingDelay	-
	DRILL #2	TurnCode	1/2/2014 7:47:19 PM	1/2/2014 8:07:25 PM	drilling	OperatingDelay	-
	DRILL #2	TurnCode	1/2/2014 8:09:07 PM	1/2/2014 8:27:51 PM	drilling	OperatingDelay	-
	DRILL #2	TurnCode	1/2/2014 8:31:02 PM	1/2/2014 8:30:31 PM	drilling	OperatingDelay	-
	DRILL #2	TurnCode	1/2/2014 9:02:26 PM	1/2/2014 9:32:34 PM	drilling	OperatingDelay	-
	DRILL #2	TurnCode	1/2/2014 10:26:37 PM	1/2/2014 10:58:54 PM	drilling	OperatingDelay	-
	DRILL #2	TurnCode	1/2/2014 10:58:54 PM	1/2/2014 11:25:13 PM	drilling	OperatingDelay	-
	DRILL #2	TurnCode	1/2/2014 11:31:10 PM	1/2/2014 11:57:36 PM	drilling	OperatingDelay	-
	DRILL #2	TurnCode	1/4/2014 12:09:28 AM	1/4/2014 12:39:59 AM	drilling	OperatingDelay	-
	DRILL #2	TurnCode	1/4/2014 12:44:16 AM	1/4/2014 1:18:15 AM	drilling	OperatingDelay	-

View events

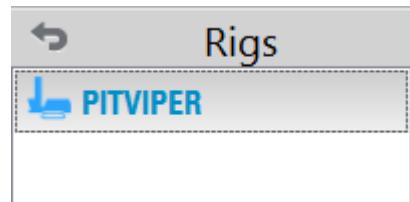
The main screen of the *Event editor* lists the events. The main view enables filtering of date, machine and event type to assist the user in finding the exact object that they need to view or adjust.

Click *Refresh* to refresh the events.

To open an item for editing double click on it in the event list.

Filter by rig

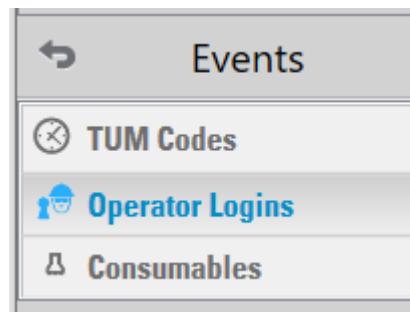
To filter the event list by machine, click the machine name in the list. The currently active machine filter will be displayed in blue.



Clicking the back arrow next to *Rigs* will clear the active filter.

Filter by event type

To filter the event list by event type, click the type in the list. The currently active event type filter will be displayed in blue.



Clicking the back arrow next to *Events* will clear the active filter.

Export event change log

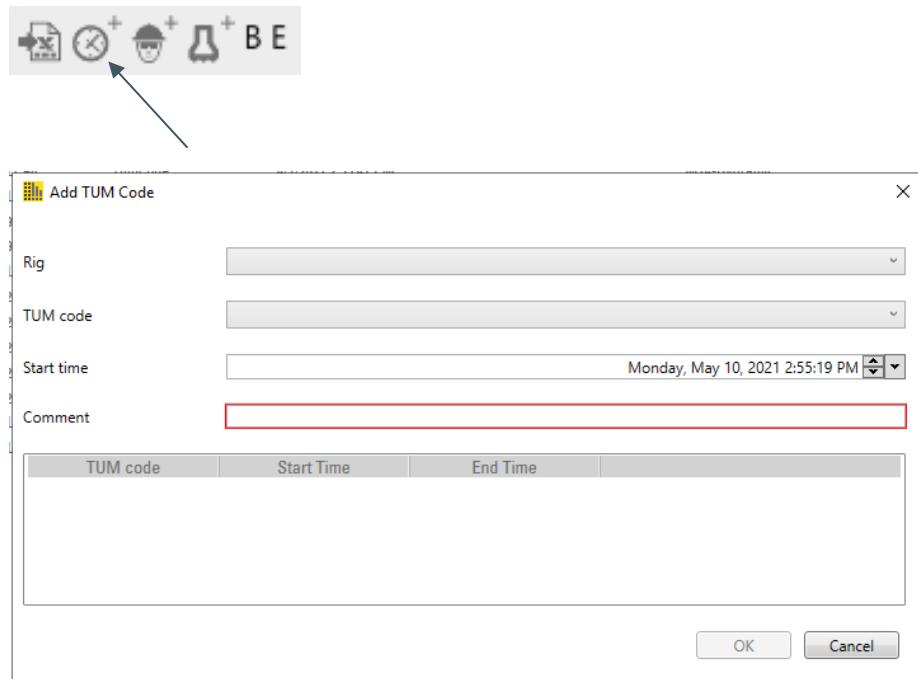
To export an excel document with all event changes registered between the selected dates, click the export change log button.



Select a folder and enter a name. The default name is the current date and time. Click the save button to generate the report. It will be opened automatically if the export succeeds; otherwise, an error message is displayed.

Add TUM Code

To add a tum code, click the **Add TUM Code** icon.



Select the machine that the TUM code should apply to, and the TUM code you wish to apply.

The start time box can be modified by keyboard and/or mouse to set the desired start time for the new TUM code.

You will also have to enter a comment.

Click **OK** to save the TUM code.

Viewing nearby TUM codes for selected rig

Once the machine is selected a list of existing TUM codes which are nearby to the start and end time set on the TUM code form is shown.

TUM code	Start Time	End Time
002-Fuel/Lube	3/24/2015 8:40:51 PM	3/24/2015 8:46:39 PM
M10-Electrical	3/24/2015 9:10:02 PM	3/24/2015 9:38:20 PM
M10-Electrical	3/24/2015 9:38:21 PM	3/24/2015 9:38:21 PM
041-Bit change	3/25/2015 12:02:04 AM	3/25/2015 12:02:04 AM
M93-Sched Maint	4/1/2021 2:30:09 PM	4/1/2021 2:30:09 PM

Assisted TUM code placement

To assist in placing TUM codes, clicking on a TUM code in the list will preset the new TUM code to slot in between the TUM code that was clicked, and the one before it.

For example, clicking the TUM code in the list starting at 1:05:20 PM will set up a TUM code to fill the time gap between 13:04:26 and 13:05:20.

TUM code	Start Time	End Time
5000Breakdown	2/1/2018 1:03:10 PM	2/1/2018 1:04:26 PM
5000Breakdown	2/1/2018 1:05:20 PM	
2000ShiftChange	2/1/2018 1:05:20 PM	2/1/2018 1:17:06 PM
5000Breakdown	2/1/2018 1:05:20 PM	
2000ShiftChange	2/1/2018 1:05:20 PM	2/1/2018 1:17:06 PM

New TUM code validation

Surface Manager performs some validation on the new TUM code to ensure that nothing overlaps, and that the values make logical sense.

TUM codes must conform to the following rules:

- No dates can be in the future
- The start date must be before the end date
- No TUM code can overlap another (But they can start/stop on the same second).

Edit TUM code

To edit a TUM code, double click on the TUM code in the event list to open it in the editing window.

The screenshot shows the 'Edit TUM code' dialog box. It contains the following fields:

- Rig: Drill #4
- Start time: Thursday, April 1, 2021 2:10:37 PM
- TUM code: M21-Air System
- TUM Category: Idle Time
Selected TUM Category does not match the TUM definition of this code
- Comment: M21 Tumcode

At the bottom right are 'OK' and 'Cancel' buttons.

Adjust the data to correct values, enter a comment and click **OK** to save it.

Clicking **Cancel** will abort the editing without changing any values.

Add operator login

To add an operator login click the **Add Operator** button.

The screenshot shows the 'Add Operator Login' dialog box. It contains the following fields:

- Rig
- Operator
- Start time: Friday, 3 July, 2020 10:40:09
- Comment

A red arrow points from the 'Add Operator' button in the toolbar above to the 'Operator' field in the dialog box. At the bottom right are 'OK' and 'Cancel' buttons.

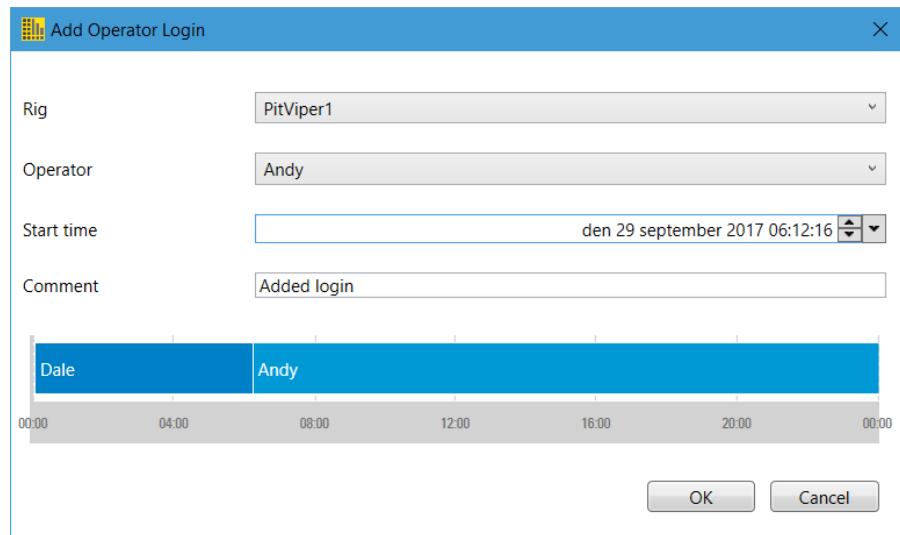
Select the machine that the operator is logged in to, and select the operator who was logged in. Set the start time to the time of the login.

Once the Rig, Operator, and Comment fields are set, the preview bar will be shown. The preview bar displays how the new login will sit between other login events *on the same day*.

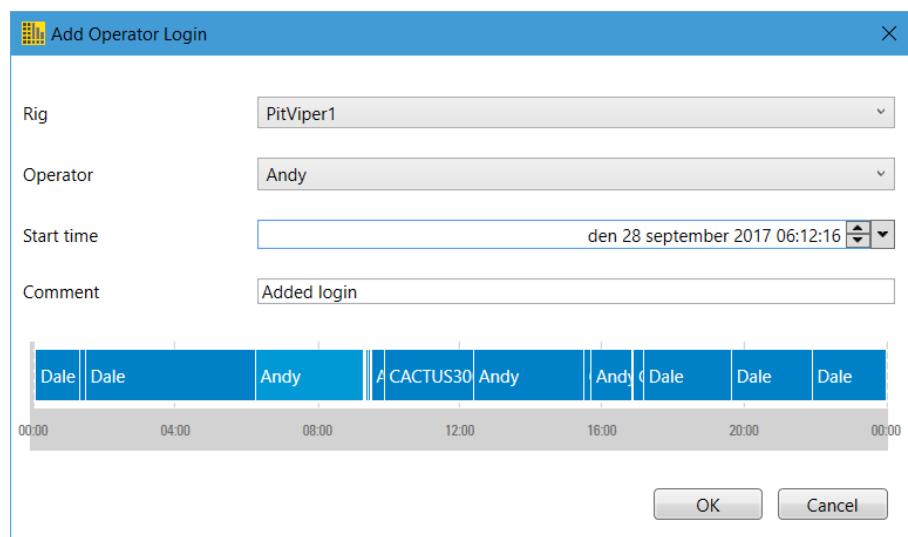
Enter a comment and click **OK** to save the operator login.

Add operator login preview

The following shows an operator login placed ‘now’. It fills up the rest of the bar as there are no more logins after it. This would imply that this operator is on the machine ‘now’.

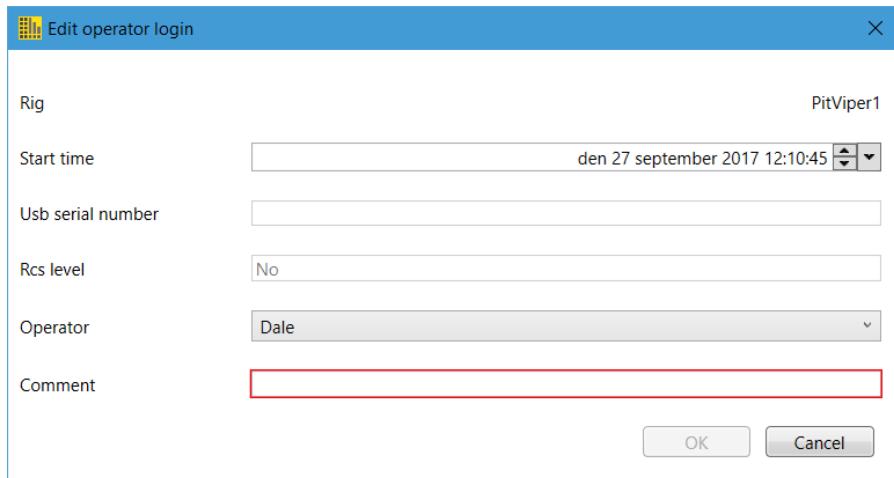


The next image shows the preview bar of an operator login being added ‘in the past’. It will fill the gap between other operator logins on the same day.



Edit operator login

To edit an operator login, double click on it in the event list to open it in the editing window.



The edit operator window shows extra information not available when adding logins. This is because it is not possible to create a fake 'USB Login' event.

- USB Serial Number: The internal number of the USB Stick logged into the RCS
- RCS Level: The access level of the USB Stick.

It is not possible to adjust these values as they are hard defined on the USB Login Stick, which are the 'source of truth' for that data.

Adjust the time of the login, the operator who logged in, and write a comment about the changes.

Click **OK** to confirm the changes.

Add consumable change

To add a new consumable change, click the **Add Consumable** icon.



Add Consumable Change

Rig	<input type="text"/>
Start time	<input type="text"/> den 12 oktober 2017 13:23:17 <input type="button"/>
Old part number	<input type="text"/>
New part number	<input type="text"/>
Consumable type	<input type="text"/>
Comment	<input type="text"/>

OK **Cancel**

Select the machine which is having/had the consumable changed, and set the time that this occurred. It is required to input both the old and new part numbers into the window to be able to save the event.

Finally, select a consumable type from the drop-down list. The possible options are:

- Drill Bit
- Drill Steel 1
- Drill Steel 2
- Drill Steel 3
- Drill Steel 4
- Hammer
- Shock Sub
- Stabilizer

Enter a comment and click **OK** to save the new consumable change.

Add consumable change preview

Similar to operator logins, consumable changes will also show a preview bar once all fields are valid in the window.

Add Consumable Change

Rig	PitViper1
Start time	den 28 september 2017 19:23:17
Old part number	Old drill bit
New part number	New drill bit
Consumable type	Drill bit
Comment	Added drill bit change

SB44-7610634 SB44-761 New drill bit

00:00 04:00 08:00 12:00 16:00 20:00 00:00

OK Cancel

Edit consumable change

To edit a consumable change, double click on it in the event list to open it in the editing window.

Edit consumable change

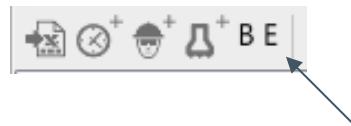
Rig	PitViper1
Start time	den 28 september 2017 17:09:12
Old part number	RD - 94008
New part number	RD - 94009
Consumable type	Drill steel 1
Comment	

OK Cancel

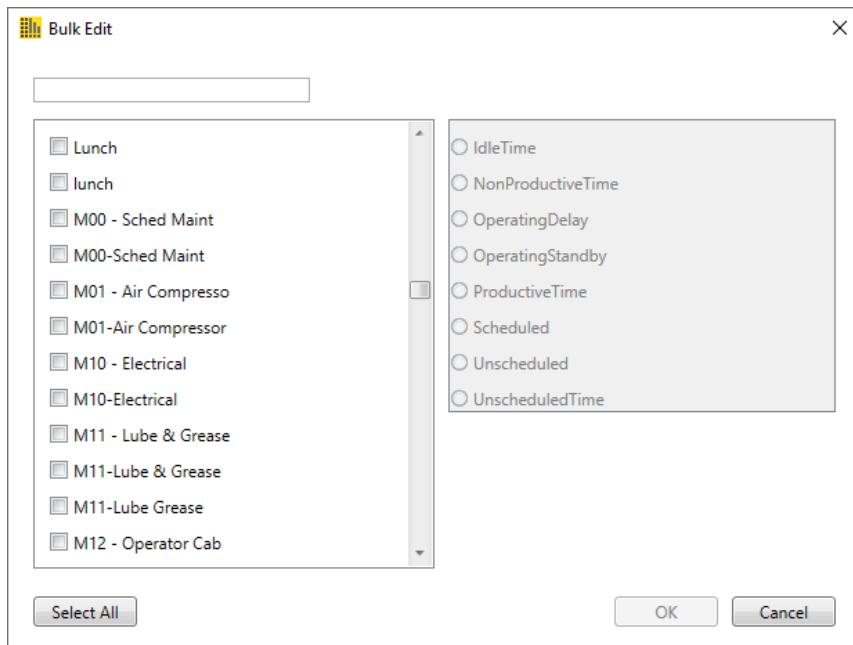
The same rules apply to editing as they do to adding new consumable changes.

Click **Save** to confirm the changes to the consumable.

Bulk Edit



Bulk Editor can be used to assign multiple TUM codes having similar names to the same TUM category.

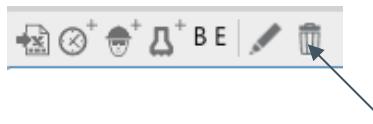


Type a common sub text that will match all the related TUM codes which will then show all the matching TUM codes as the search result.

Select the applicable TUM codes and then assign to the appropriate TUM Category on the right side. Click on OK to apply the changes.

Delete event

To permanently delete an event, select the event, and then click the delete button on the toolbar.



Remarks

Introduction

The main screen of Hole Remarks will look like below, with columns: Hold Id, Drill Plan, Rig, Log Time, Category and Keyword. The remarks can be further filtered by time, rigs or drill plans.

The remarks can also be exported to Excel files.

8992011529	Log Time	Serial Number	Time	Drill Plan Id	Hole Id	Category
DR1016	4/21/2020 9:10:54 A	8992011529	4/21/2021 10:11:39 AM	263101b2ef	13	TYPE OF ROCK
DR1336	4/21/2020 9:10:54 A	8992011529	4/21/2021 10:11:39 AM	263101b2ef	13	END
DR1527	4/21/2020 9:10:54 A	8992011529	4/21/2021 10:11:39 AM	263101b2ef	13	Start
DR1529	4/21/2020 9:14:25 A	8992011529	4/21/2021 10:11:39 AM	263101b2ef	13	TYPE OF ROCK
DR3027	4/21/2020 9:14:25 A	8992011529	4/21/2021 10:11:39 AM	263101b2ef	13	Start
DR3028	4/21/2020 9:15:19 A	8992011529	4/21/2021 10:11:39 AM	263101b2ef	Gen1	TYPE OF ROCK
DR3029	4/21/2020 9:14:25 A	8992011529	4/21/2021 10:11:39 AM	263101b2ef	13	END
DR3033	4/21/2020 9:15:19 A	8992011529	4/21/2021 10:11:39 AM	263101b2ef	Gen1	Start
DR3038	4/21/2020 9:15:19 A	8992011529	4/21/2021 10:11:39 AM	263101b2ef	Gen1	END
	4/21/2020 9:15:38 A	8992011529	4/21/2021 10:11:39 AM	263101b2ef	Gen1	TYPE OF ROCK
	4/21/2020 9:15:38 A	8992011529	4/21/2021 10:11:39 AM	263101b2ef	Gen1	END
	4/21/2020 9:15:38 A	8992011529	4/21/2021 10:11:39 AM	263101b2ef	Gen1	Start

Object management

Introduction

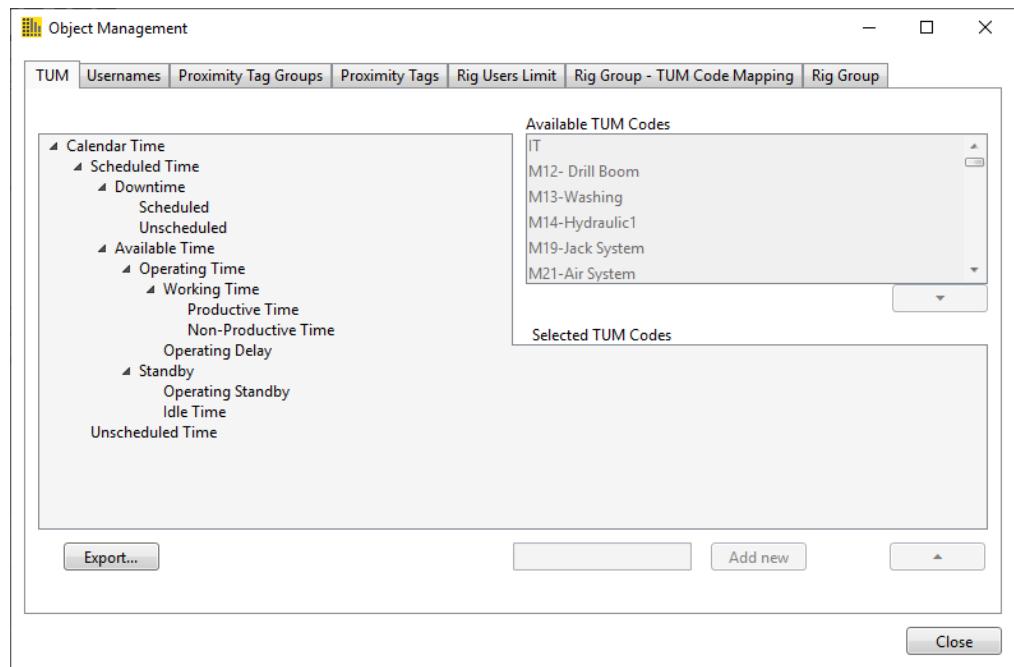
Machine contextual objects can be centrally managed within Surface Manager. This covers tum codes, machine operator names, proximity tags groups, proximity tag assignments, rig user limits, rig group – tum code mappings and rig groups.

The benefit to using a centralized management system is that these important items can be synchronized through the whole Epiroc surface fleet.

View TUM Codes

Open the **Tools> Object management** menu.

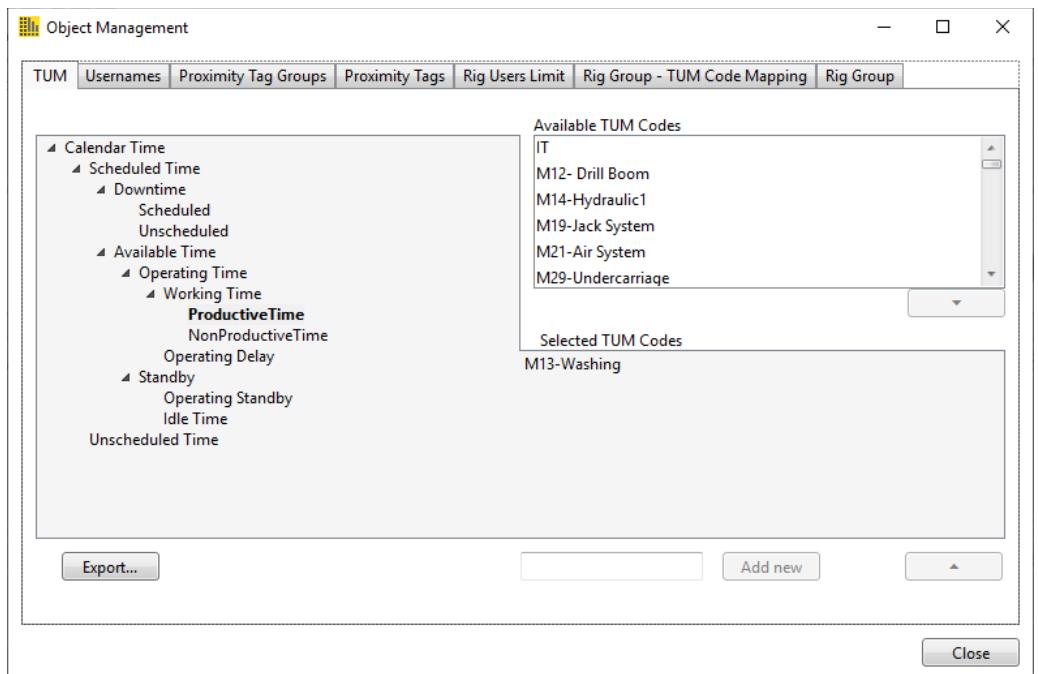
The Object Management screen shows first tab, TUM containing the GMG Time Utilization Model (TUM) TUM category hierarchy on the left side and the TUM codes on the right side.



The TUM categories in the hierarchy have several “leaf” nodes, i.e., nodes without any children below them. The TUM codes can be assigned to any of these categories.

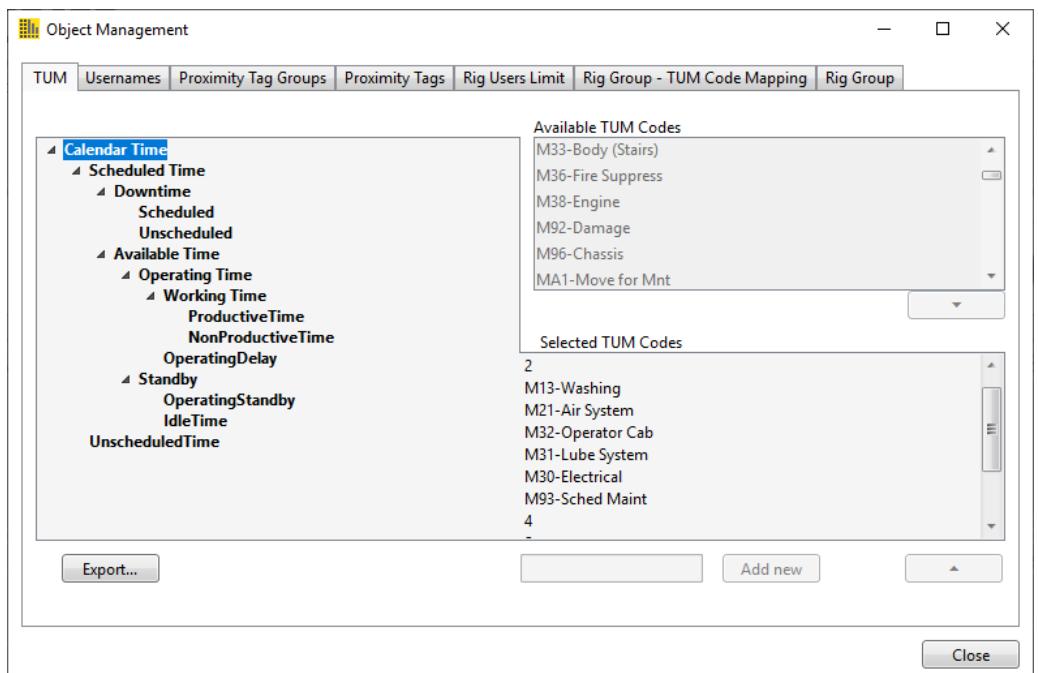
The TUM codes shown under “Available TUM Codes” contains the list of codes which are available to be mapped to the leaf TUM categories.

Select a leaf TUM category, which will enable the list containing available TUM codes. Once a TUM code is selected, the down arrow button is enabled. Click on the button to associate the TUM code to the category selected earlier.



The TUM codes mapped to the TUM category are now available on the bottom right corner of the screen. Move up the hierarchy and select one of the parent categories.

Select any of the leaf category, and move upward towards the root, i.e. the Calendar Time. This will result in showing the mapped TUM codes on the bottom right side of the dialog, under "Selected TUM Codes" section.



Hover over the TUM codes under Available TUM Codes to see edit / delete options.



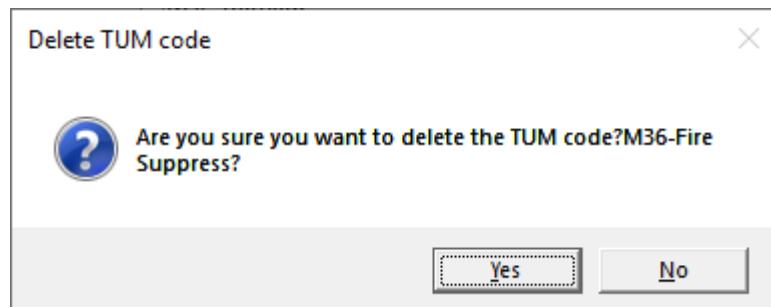
Clicking on the *Edit* button will result in showing the Edit TUM Code dialog, where you can rename the TUM Code and click on OK.



Clicking on the x button will result in deletion of the TUM code.



Click the **Yes** button to confirm remove the TUM code.



Export TUM Hierarchy

Export TUM Codes to File

Click the **Export...** button. A folder can be chosen where the TUM hierarchy will be saved as XML file. This file contains the mapping of TUM hierarchy with the TUM codes associated.

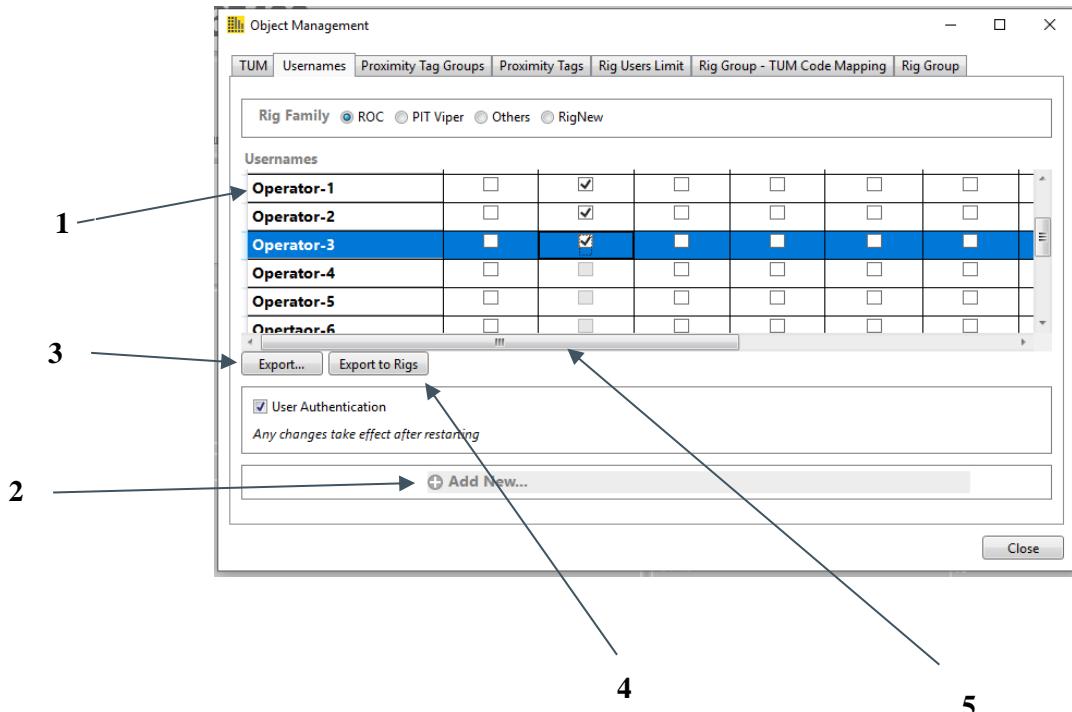
User Names

Rig users are assigned to the rigs that they can operate using this screen. There are rig families like Roc, Pit Viper. Each of these families have rig types, for example: SmartRoc C50, SmartRoc C70. These rig types have a limit to the rig users they support. Ex SmartRoc C50 might have rig users limit of 8. So the number of rig users that can be mapped to the rig is 8.

There are two primary screens which are involved in exporting users to Rigs.

- a) **Rig User Limit:** Allow to define the limit of rig users that can be assigned to a rig type.
- b) **Usernames:** Add rig users and export the rig user to rigs. Besides the normal export functionality, the usernames tab has another important responsibility, of making sure that the number of operators that are assigned remained **less than or equal to the** rig users limit defined for the rig.

Adding, Editing, Deleting rig users and exporting to Rig



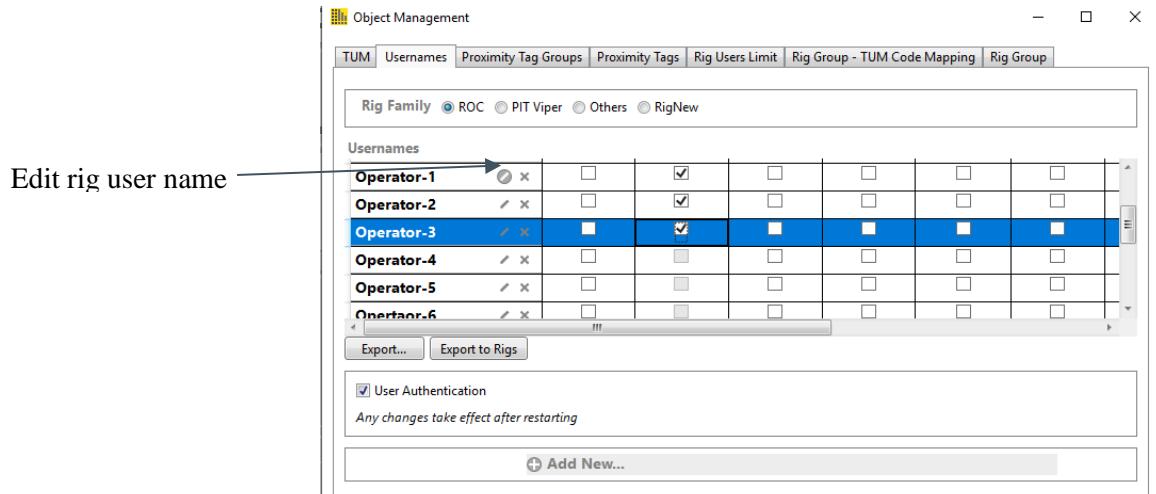
Legend	Feature
1	Rig User – Edit/Delete
2	New Rig User Add
3	Export Rig User to file
4	Export Rig User to RIG direct through RRA
5	User will not be able to select any more Rig Users once the Limit is reached for the Rig

The Usernames tab assists the user in

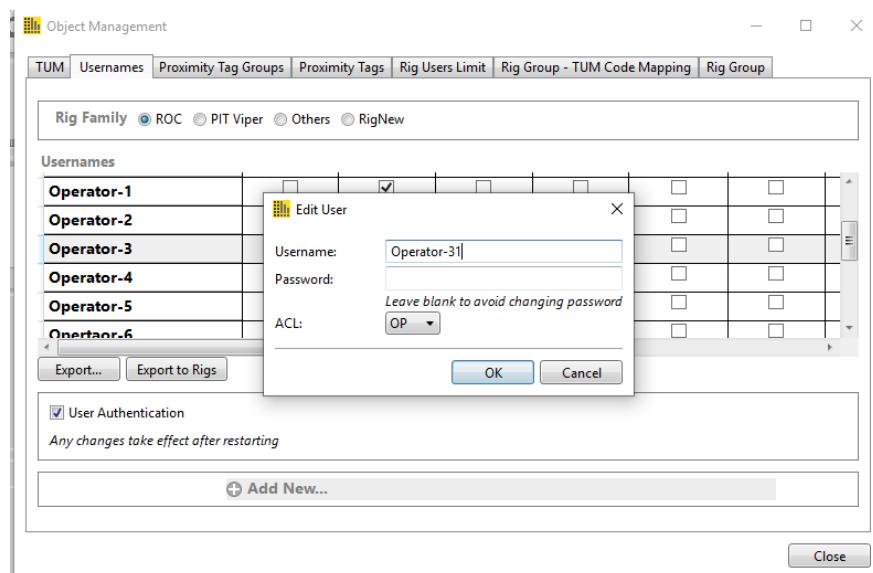
1. Creating new rig user
2. Deleting rig user
3. Editing rig user details
4. Assigning rig users to rigs, based on the rig limit provided in the Rig User Limit tab
5. Exporting the rig user, both through File and through RRA

Edit Rig Users

User can change rig user name, password and ACL by clicking on Edit User pencil icon



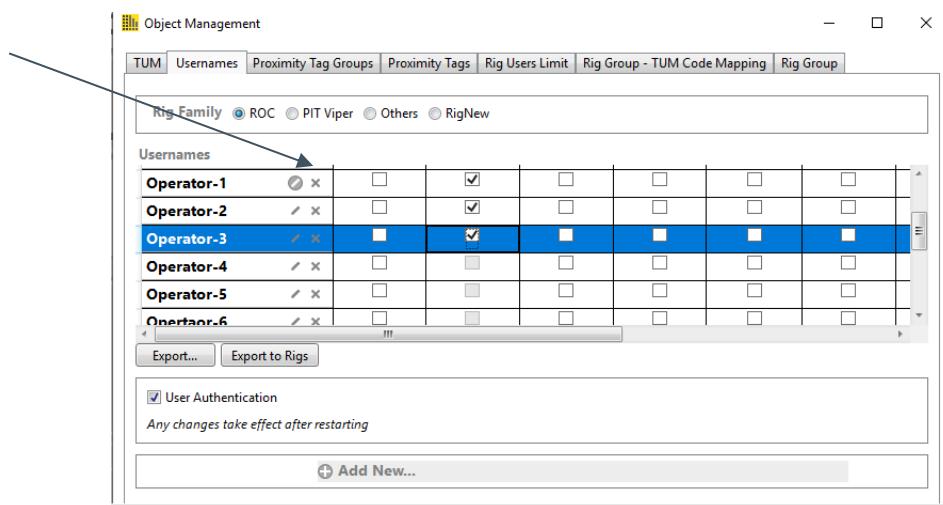
Click on OK to make the change permanent.



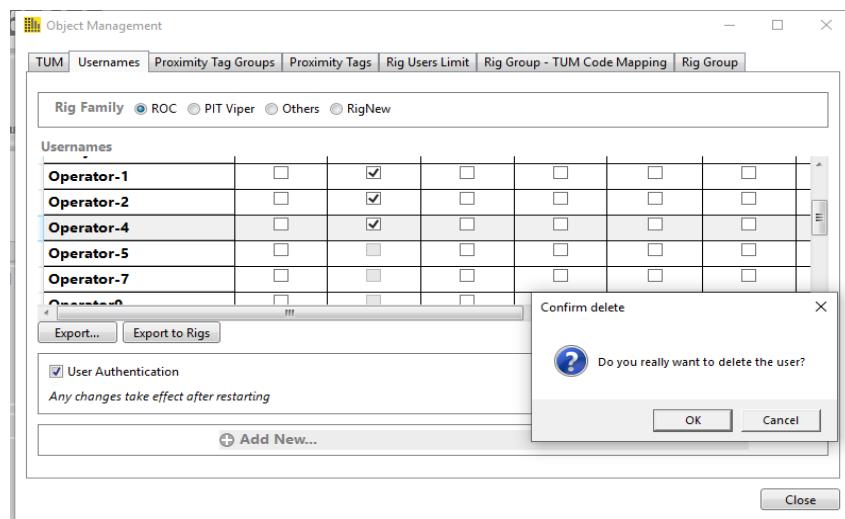
Delete Rig Users

Rig user can be deleted by clicking on the cross icon near the edit icon.

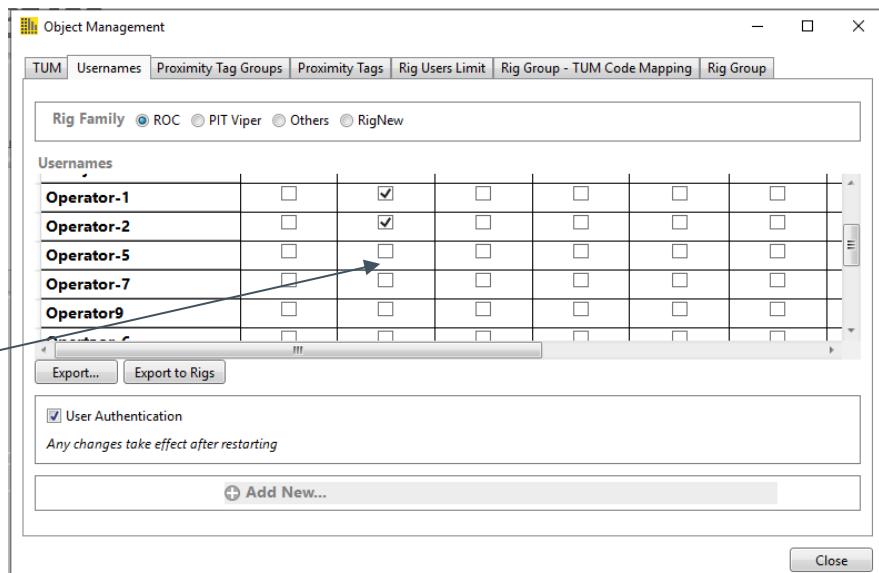
Delete rig user



The user will get a prompt asking to confirm deletion.



Once the rig user is deleted, user will be able to select a rig user again for assignment to rig since the no of users assigned to the rig are now less than the rig user limit.

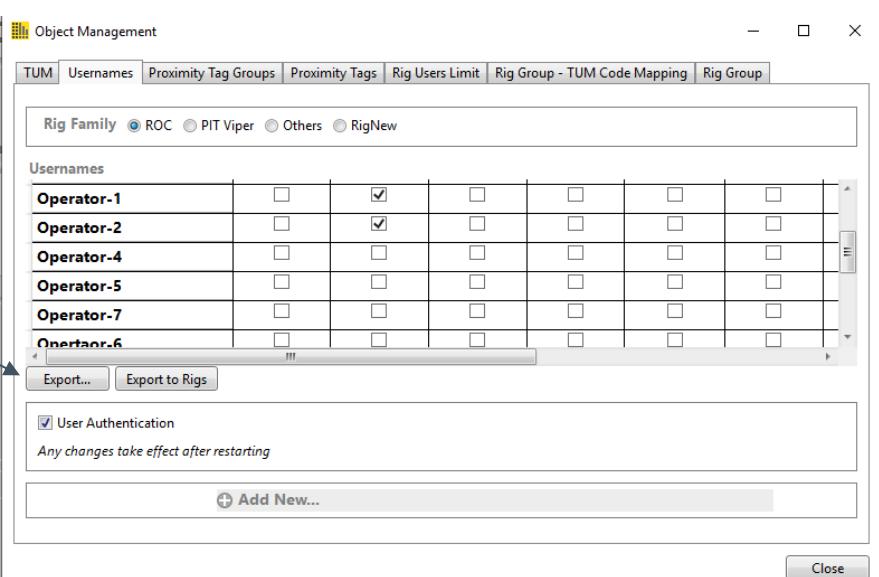


Select option enabled

Export Rig User to file

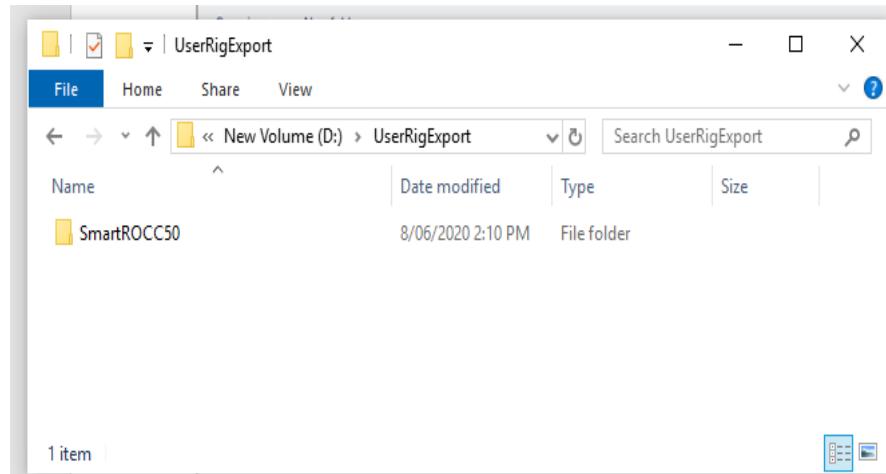
Clicking on Export will allow the user to Export the rig users to a file that can further be imported to the Rig

Export

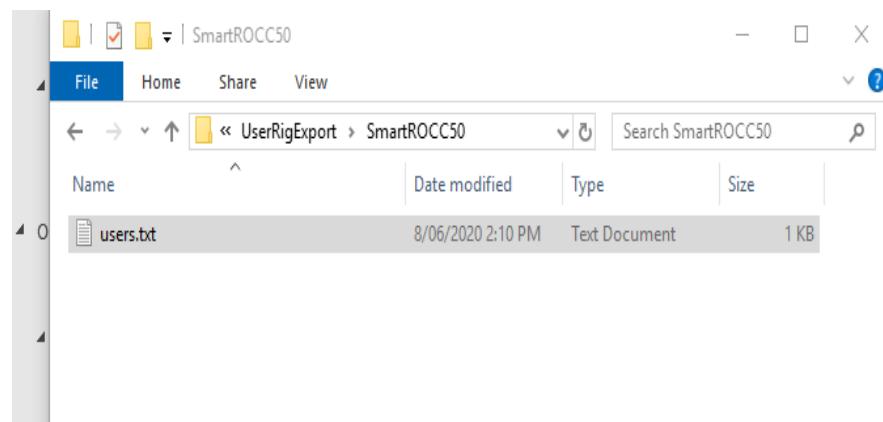


UserRigExport folder for rigs

This folder will have individual rig name folders. These folders will have the users.txt file, which then can be exported to individual rigs.

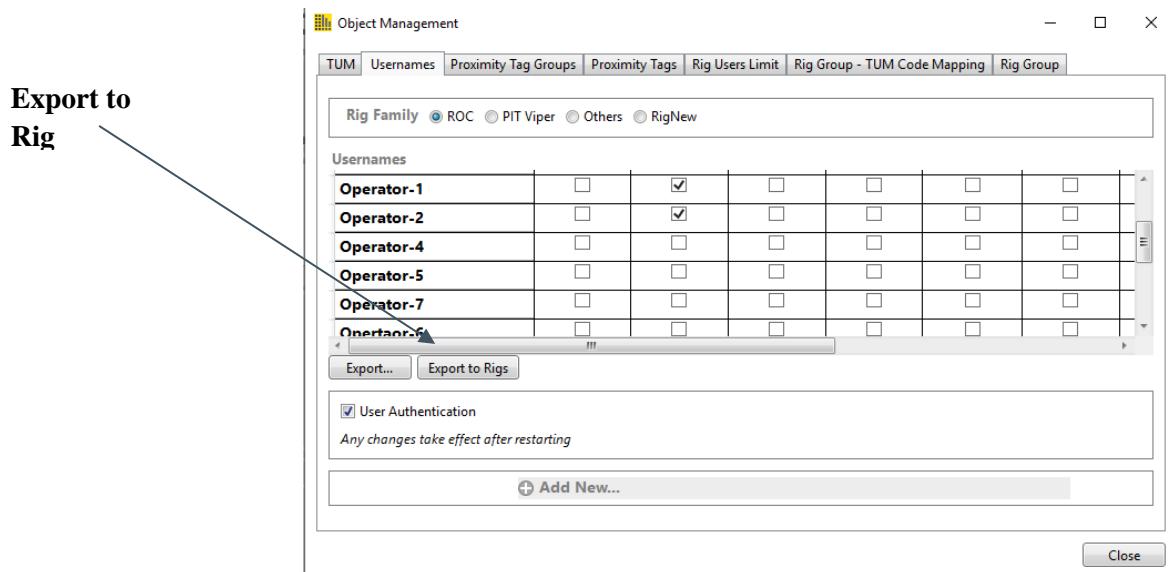


The users text file will be created in the path UserRigExport\rigname\

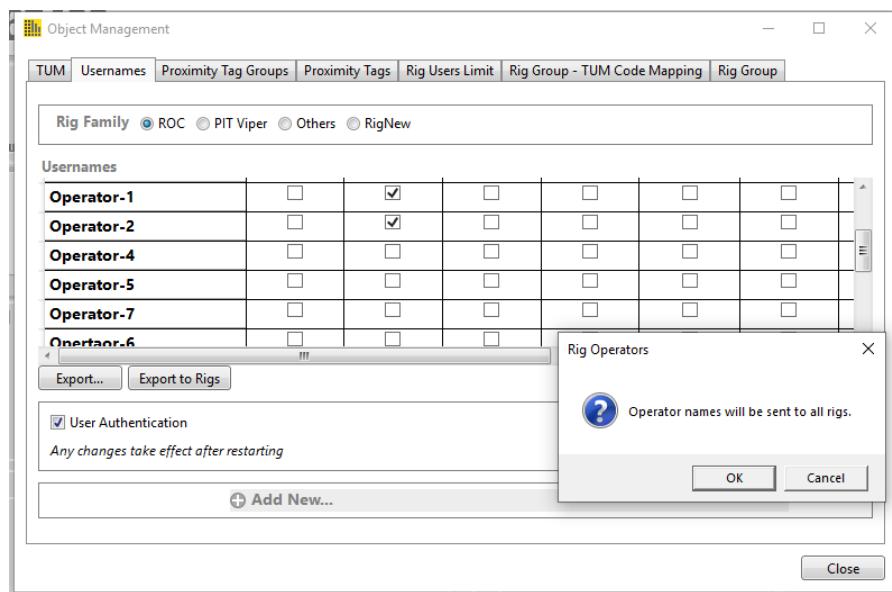


Export rig users to rigs through RRA

This option will not require an intermediary file and let the user export the rig users to rigs directly through RRA.



Click on Export to Rigs option to transfer the rig users to rigs through RRA

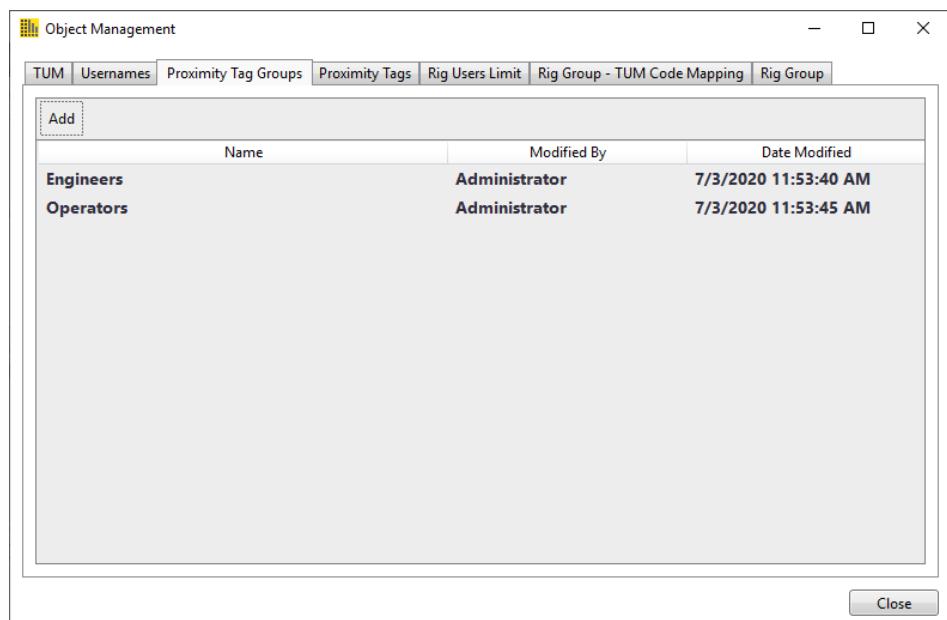


A confirmation message will be shown to the user.

Proximity Tag Groups

Select the **Proximity Tag Groups** tab to view the groups which the proximity detection tags can to be assigned to.

The **Proximity Tags Groups** table displays the group name, the username of the person who last modified the group, and the time it was last updated.



The screenshot shows the 'Object Management' application window. The title bar says 'Object Management'. The tabs at the top are 'TUM', 'Usernames', 'Proximity Tag Groups' (which is selected and highlighted in blue), 'Proximity Tags', 'Rig Users Limit', 'Rig Group - TUM Code Mapping', and 'Rig Group'. Below the tabs is a table with three columns: 'Name', 'Modified By', and 'Date Modified'. There are two rows in the table:

Name	Modified By	Date Modified
Engineers	Administrator	7/3/2020 11:53:40 AM
Operators	Administrator	7/3/2020 11:53:45 AM

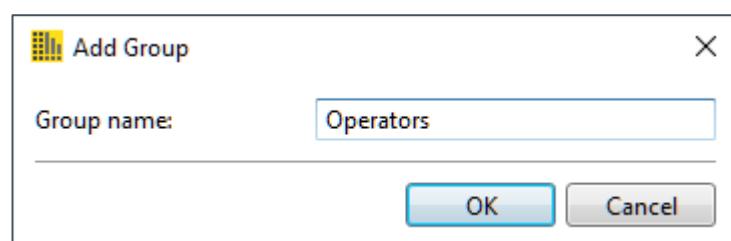
At the bottom right of the table area is a 'Close' button.

Add Proximity Tag Group

Click **Add** to create a new tag group.

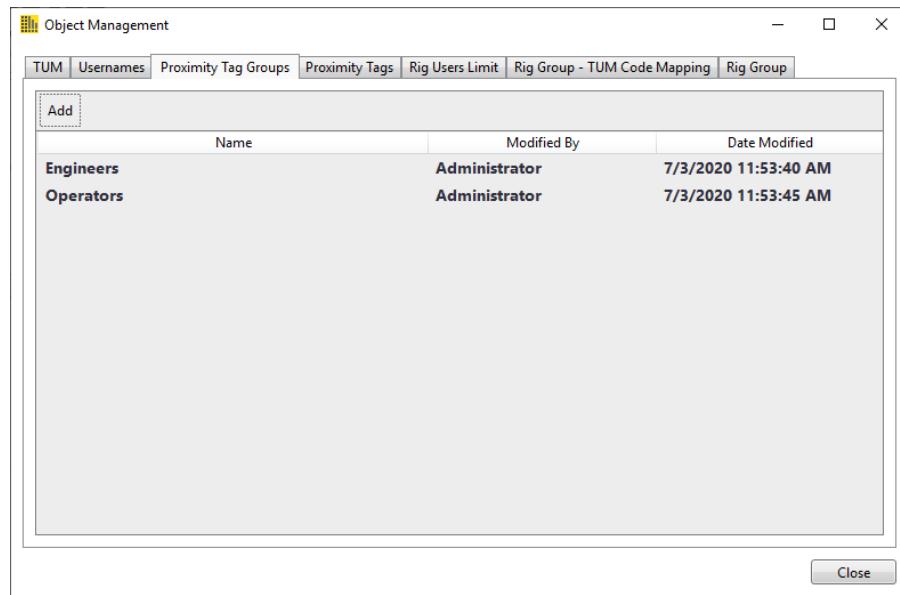
Enter the Group name.

Click **OK** to save the new proximity tag group.



The screenshot shows a 'Add Group' dialog box. At the top left is a small icon of a grid with colored squares. To its right is the text 'Add Group'. In the top right corner is a close button ('X'). Below the title bar is a label 'Group name:' followed by a text input field containing the text 'Operators'. At the bottom of the dialog are two buttons: 'OK' (highlighted in blue) and 'Cancel'.

The new proximity tag group is added to the Proximity Tag Groups list.

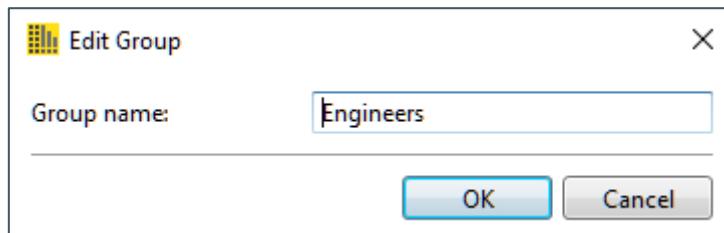


A screenshot of the Object Management software interface. The window title is "Object Management". The tab bar at the top includes "TUM", "Usernames", "Proximity Tag Groups" (which is selected and highlighted in blue), "Proximity Tags", "Rig Users Limit", "Rig Group - TUM Code Mapping", and "Rig Group". Below the tabs is a table titled "Add" with three columns: "Name", "Modified By", and "Date Modified". Two rows are listed: "Engineers" (modified by Administrator on 7/3/2020 11:53:40 AM) and "Operators" (modified by Administrator on 7/3/2020 11:53:45 AM). A "Close" button is located at the bottom right of the table area.

Name	Modified By	Date Modified
Engineers	Administrator	7/3/2020 11:53:40 AM
Operators	Administrator	7/3/2020 11:53:45 AM

Edit Proximity Tag Group

Select a proximity tag group and click **Edit**.



Delete Proximity Tag Group

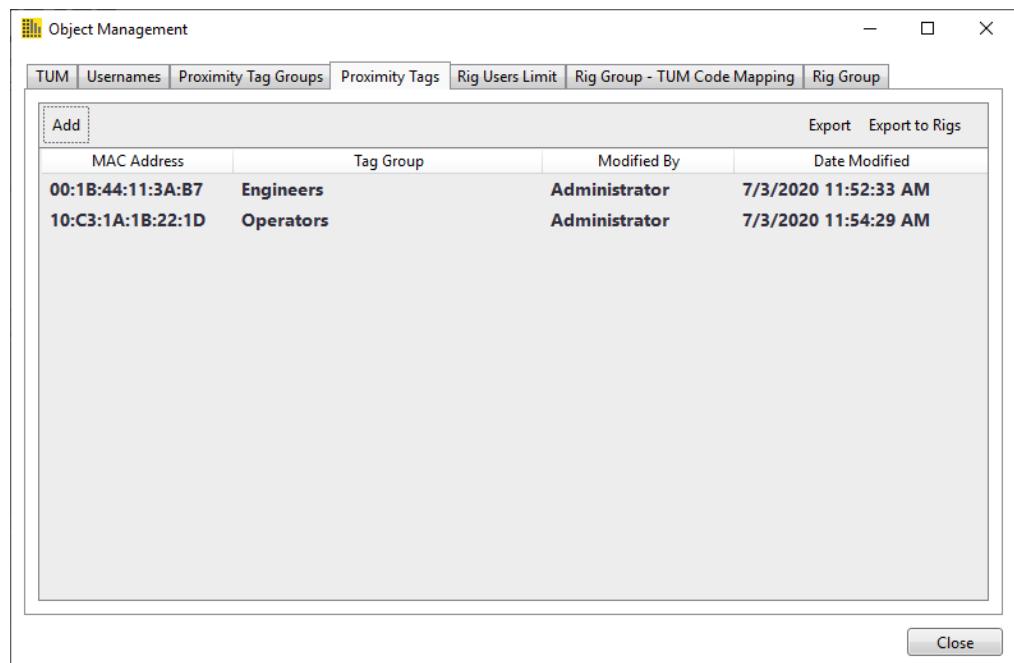
To delete a proximity tag group, select a group from the list and click **Delete**.

Click **OK** to confirm the group deletion.

Proximity Tags

Proximity tags must be added to Surface Manager before they can be used in a proximity based safety system. One component of adding the proximity tags is to create a group assignment.

This assignment allows visibility of who is in close proximity to a machine at any given time.



The screenshot shows the 'Object Management' window with the 'Proximity Tags' tab selected. The window title is 'Object Management'. The tabs at the top are TUM, Usernames, Proximity Tag Groups, Proximity Tags (which is highlighted), Rig Users Limit, Rig Group - TUM Code Mapping, and Rig Group. Below the tabs is a toolbar with 'Add' (highlighted with a dashed box), Export, and Export to Rigs. The main area is a table listing proximity tags:

MAC Address	Tag Group	Modified By	Date Modified
00:1B:44:11:3A:B7	Engineers	Administrator	7/3/2020 11:52:33 AM
10:C3:1A:1B:22:1D	Operators	Administrator	7/3/2020 11:54:29 AM

A 'Close' button is located at the bottom right of the window.

MAC Address

The physical hardware address of the proximity tag – unique to each tag.

Tag Group

The assigned proximity tag group.

Modified by

The Surface Manager user who last added or updated the.

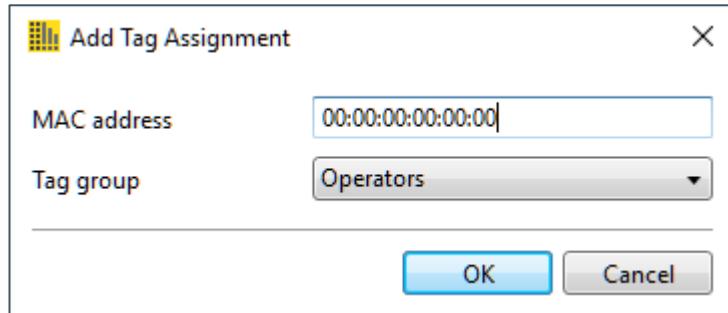
Date modified

The date and time when the tag details or assignment was last modified.

Add Proximity Tag

To add a new proximity tag and assign its group, click **Add**.

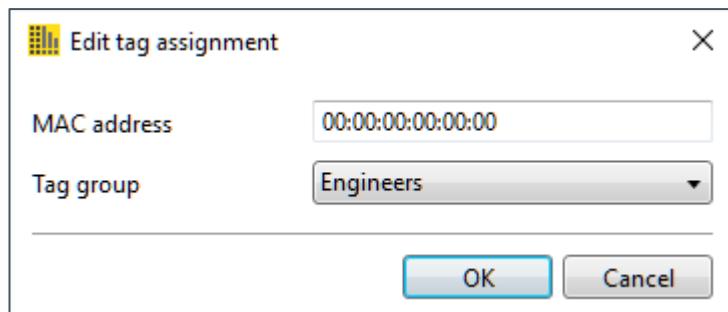
Enter the *MAC Address* of the new proximity tag, and assign the correct group.



Click **OK** to save the new proximity tag

Edit Proximity Tag

To edit a proximity tag, select the proximity tag to edit and click **Edit**.



The **Edit tag assignment** window will open.

The *MAC Address* is disabled – once a proximity tag has been assigned with a MAC address, that address cannot be changed.

Select the **Tag Group**.

Click **OK** to save the changes.

Note: The assignment changes are not automatically sent to the machine. The **Export to rigs** must be performed to send the new files to each machine, and the operator must load them onto the RCS.

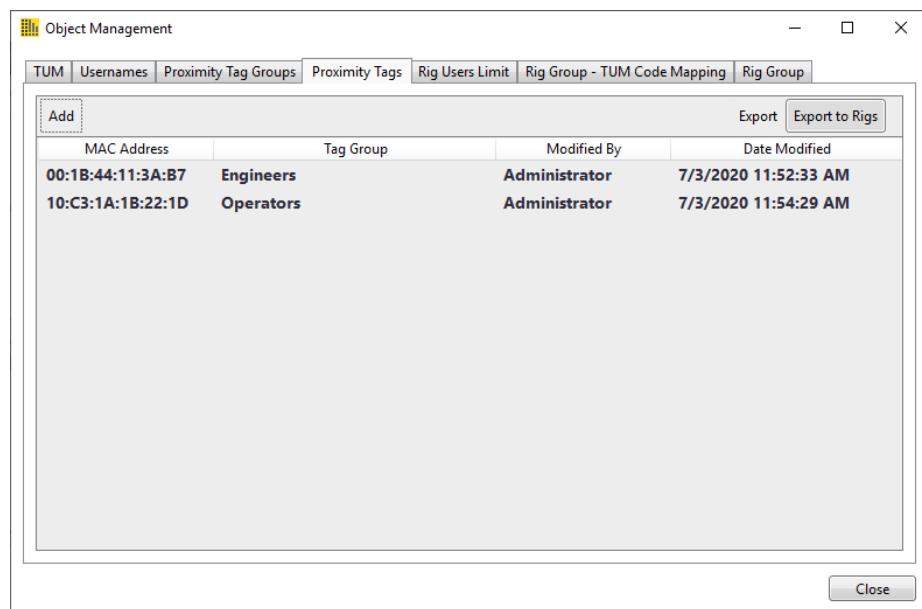
Delete Proximity Tag

To delete a proximity tag, select the proximity tag and click **Delete**.

Click **OK** to confirm the deletion.

Export Proximity Tags

From the **Proximity Tags** tab, proximity tags can be exported.



Export Proximity Tags to Rigs

Click the button **Export to Rigs**. The proximity tags will be exported to all machines (populates each linked machine's *To* folder in RRA server).

Surface Manager must be using the central database setup for this to work.
See the *Surface Manager Server User's Guide*.

Export Proximity Tags to file

Click the **Export** button.

Browse to a folder and click **Save**.

The proximity tags will be saved in a file.

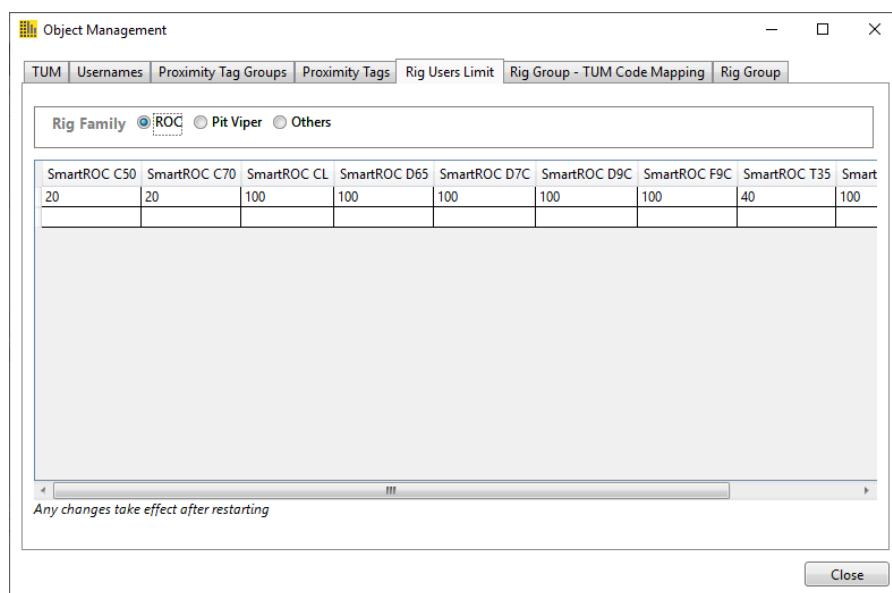
Rig Users Limit

Rig limit is the maximum number of users that can be exported to a rig

On the top of the screen with heading Rig Family, you can select the rig family for which you wish to modify the rig limit. Once you select the rig family, the rig types will be visible in the grid with the corresponding number indicating the maximum number of rig users allowed, for example Smart ROC C50 has limit of 3.

Change user limit for rig

User can change the rig user limit by specifying the maximum number of users allowed for the rig



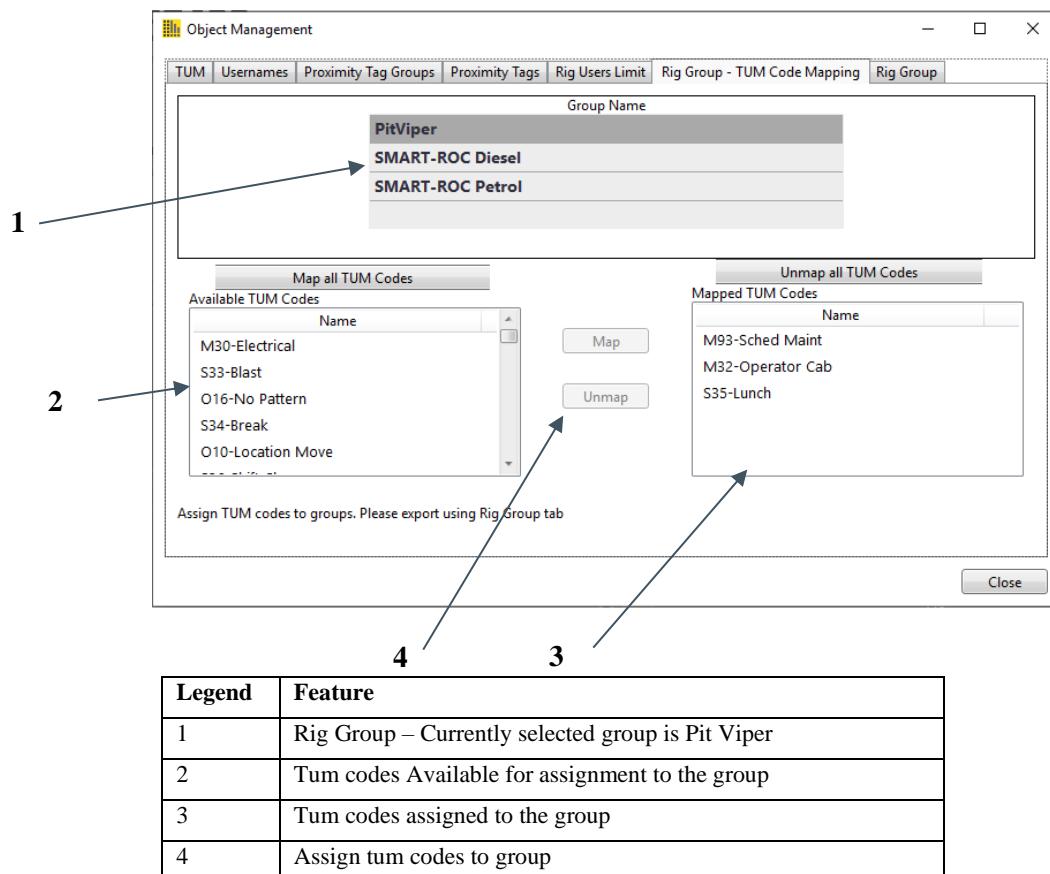
Rig Group TUM Code Mapping

This screen is used for exporting the tum codes to individual rigs based on the tum codes applicable to that rig group (explained in next section).

Tum codes to be exported can be mapped to the rig groups. The group names created in the Rig Group screen will be visible here. You will be able to map the tum codes to the groups. This can be done selecting the group in Group name then selecting available tum codes and mapping them.

Tum code assignment to group

The user will be able to map the relevant tum codes to the tum groups in this screen.

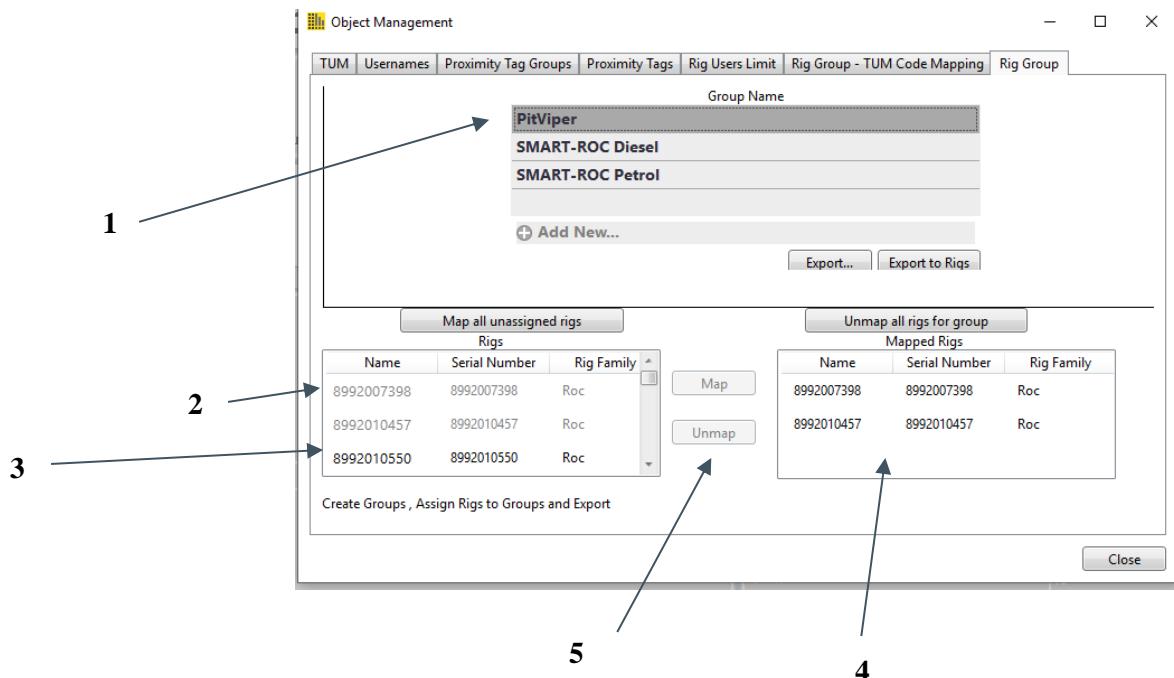


Rig Group

Different rigs have different tum code requirements. To efficiently export the correct tum codes to rigs, a concept of Rig Groups have been introduced. Rig groups can be created with rigs having similar tum code requirements. While exporting tum codes, these codes can be mapped to rig groups instead of individual rigs. Tum codes belonging to these groups then can be exported by using the Export functionality.

Create Rig Groups and assign rigs to them

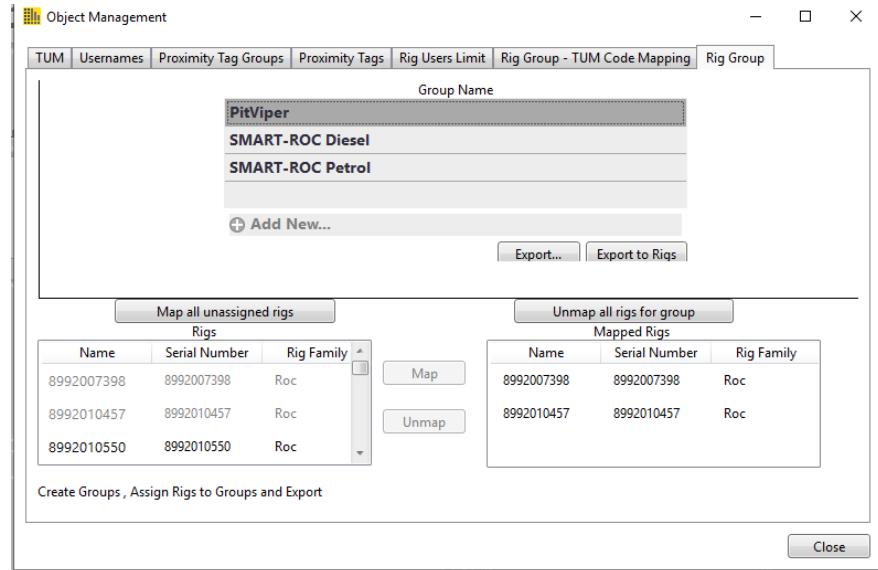
This screen helps create rig groups and assign rigs to groups. A rig can be assigned only to a single group.



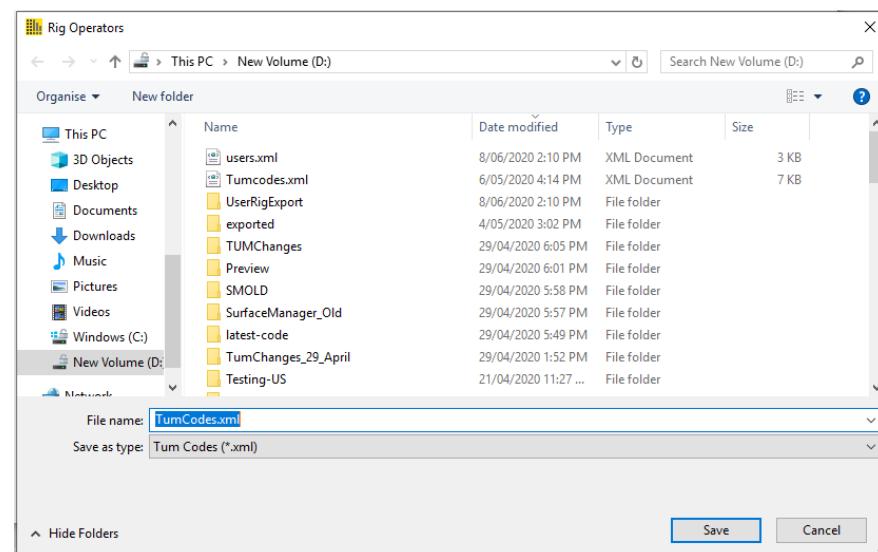
Legend	Feature
1	Rig Group – Currently selected group is Pit Viper
2	Unassigned rigs
3	Rigs already assigned to the group will not be selectable for any group unless unassigned
4	Rigs Assigned to Group- Currently the two rigs are assigned to Pit Viper
5	Assign-Unassigned rigs to and from Group

Export TUM Codes to file

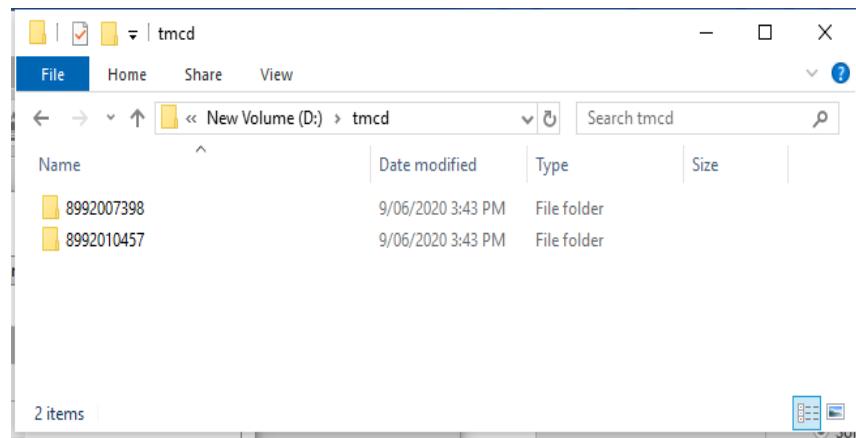
Clicking on export will enable the user to export the tum codes to the files. User will assign the rigs and tum codes to rig group. The user can then export the tum codes to specific folders for each rig in the rig group.



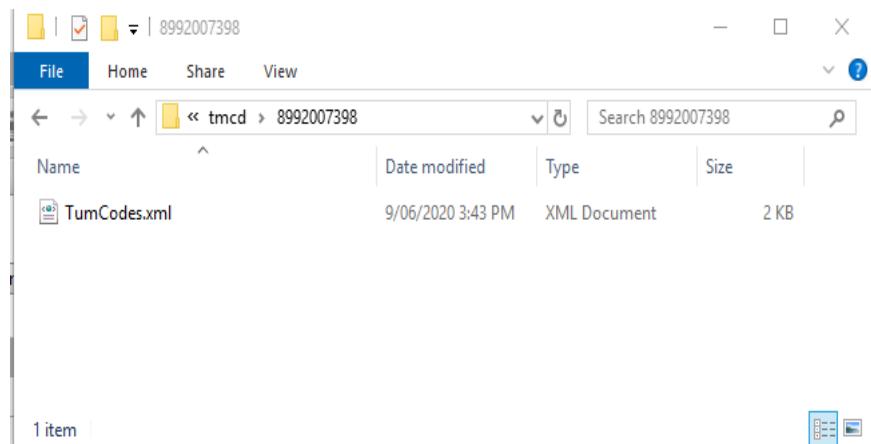
Once Export is clicked, it provides the save file dialog, which indicates where the file is going to be saved.



Here the user can create a new folder, or specify an existing folder where the tum codes will be exported



Folder for each individual rig is created in the folder specified earlier, where the individual Tumcodes.xml files will be created.



MWD color settings

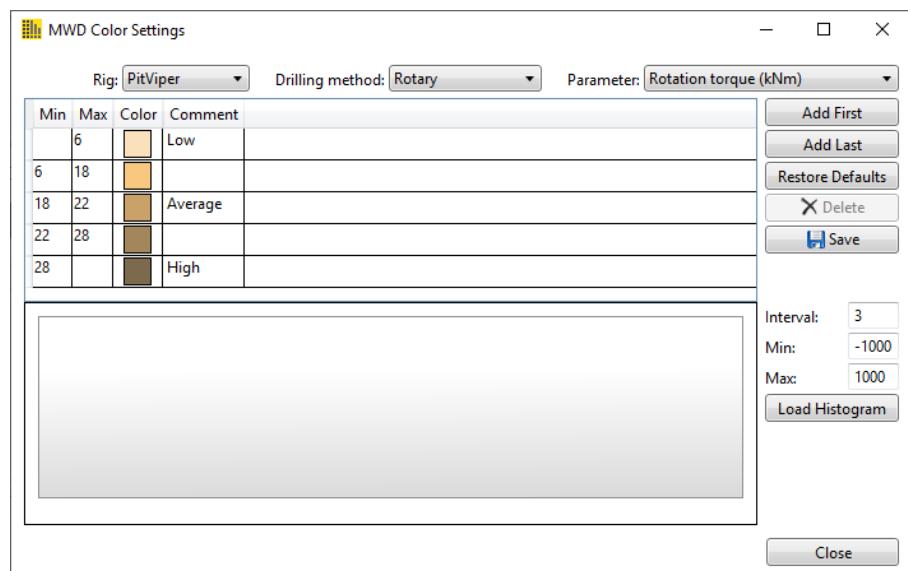
Introduction

The coloring scheme for MWD parameters in the widgets **Planned model vs drilled model** and **Rock Hardness** may be customized.

The values for each parameter may be set to a specified color.

Edit MWD colors

Open the **Settings> MWD color settings** menu.



Parameter

Select the MWD parameter to adjust the colors for.

Add first

Insert a color before first item in color range.

Add last

Add a color at the end of the color range.

Restore defaults

Restore colors for the specified parameter to defaults.

Delete

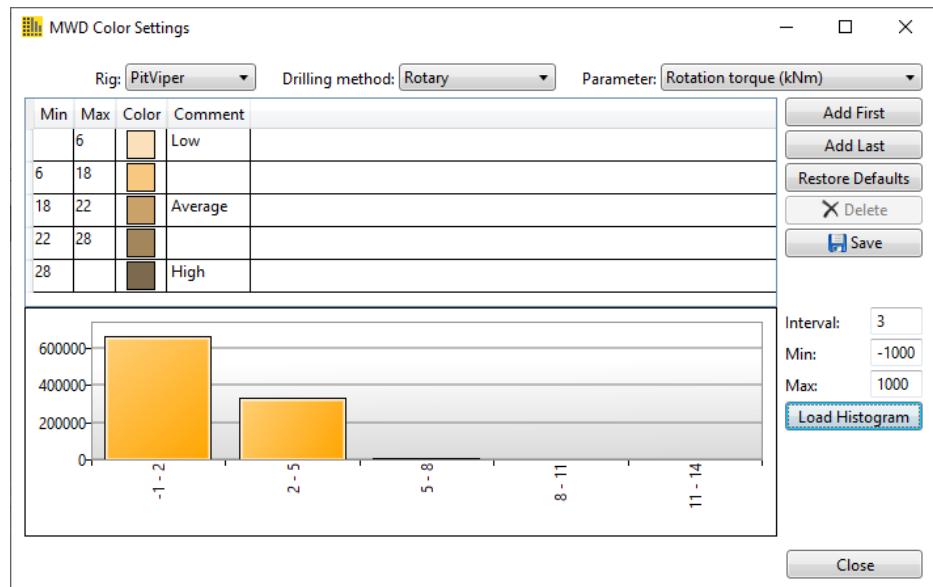
Delete the selected color.

Save

Saves the color range

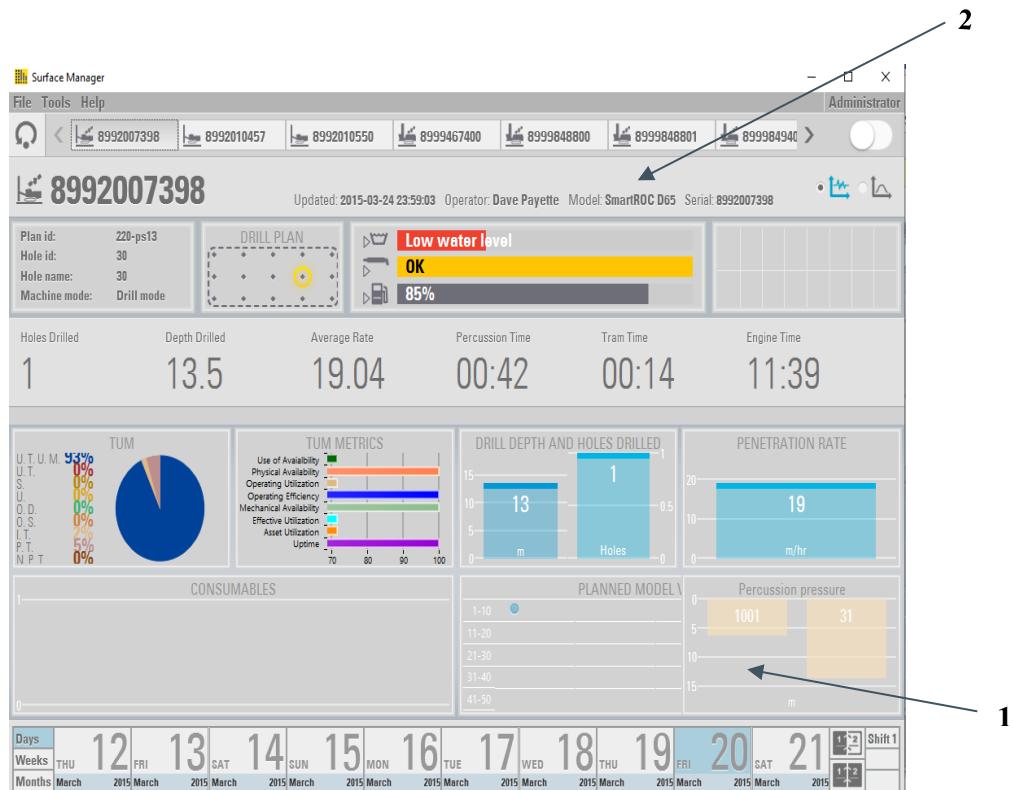
Load histogram

The histogram is a help function to give a quick view of the distribution of the values.



Change Default Measurement Displayed in Hardness-widget- MWD Color Settings

This option lets the user customize the Hardness widget based on the rig family. User will be able to change the default parameter shown to him in the Dashboard Hardness widget by selecting the same in MWD Color settings.

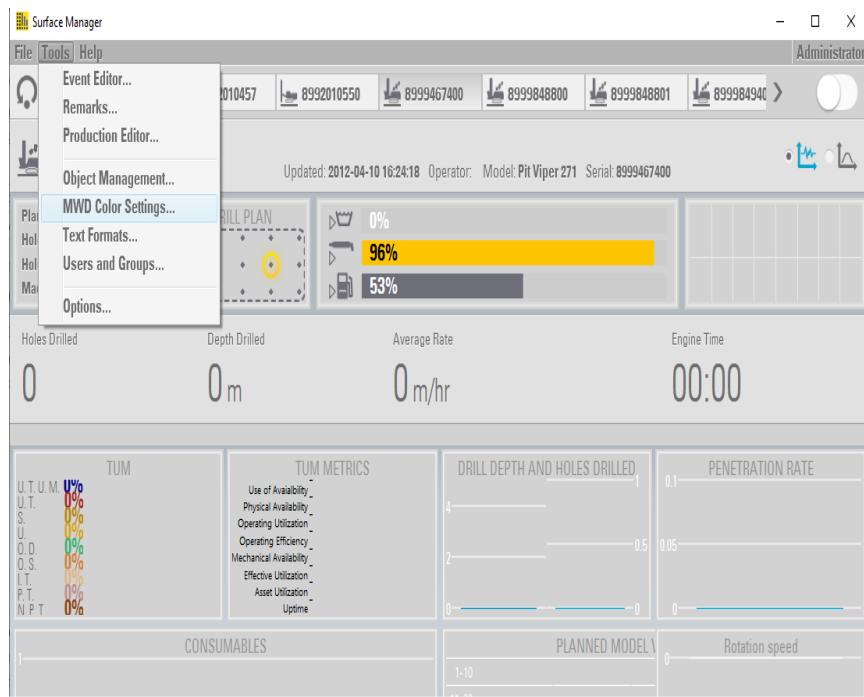


- 1 Displaying the default widget for the rig
- 2 Type of rig (The default Widget will change according to the rig type)

In the screen above, since the rig type is Smart ROC, the default widget configured is Percussion pressure

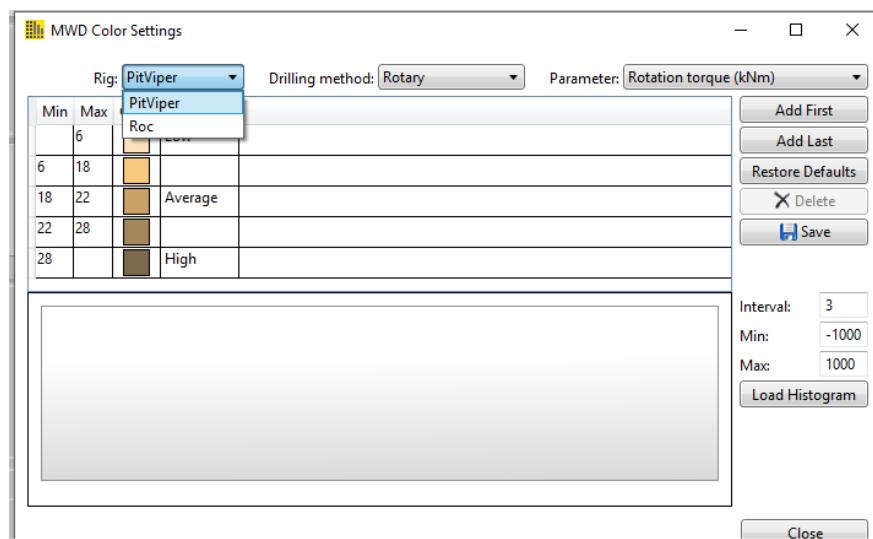
Configure Default Widget

Go To Menu Item Tools →MWD Color Settings



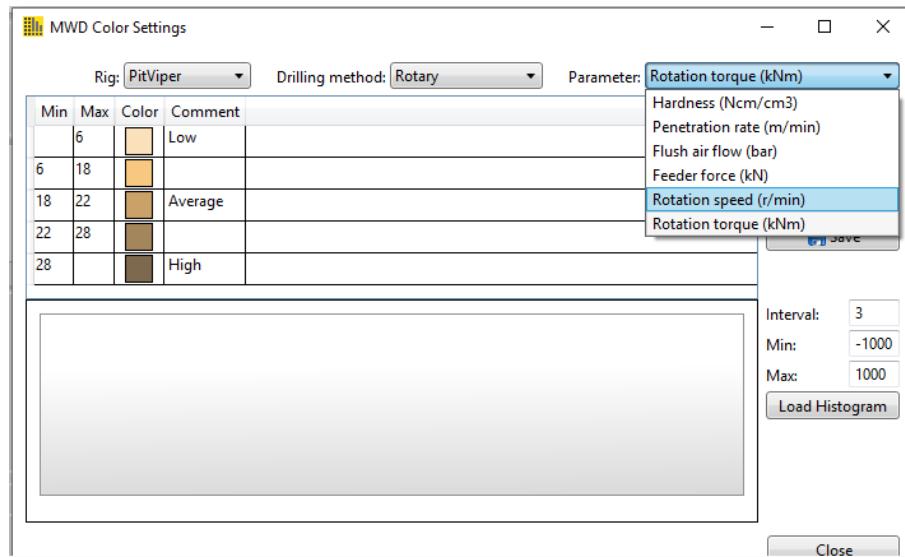
Select Rig Type

The user will select the rig type for which he wants to configure the widget default parameter for hardness widget.



Select Default parameter

The parameters displayed will change based on the rig type selected. Out of the displayed parameters user can select one as the default for the hardness widget.



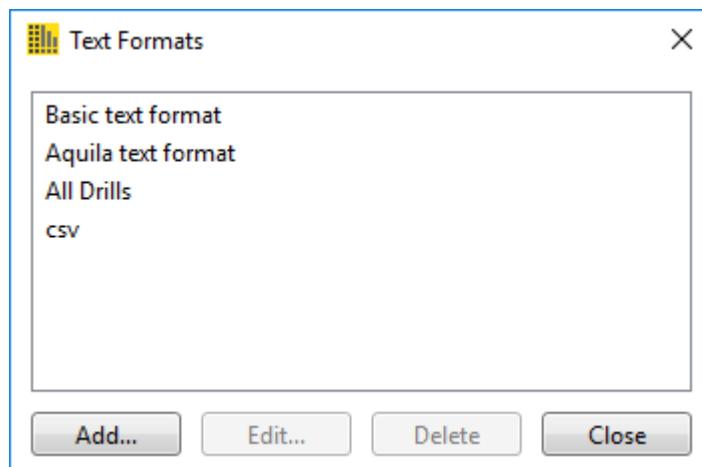
Text Formats

Introduction

Text Formats can be used to import text drill plans, e.g. csv-files, from another system, typically a CAD tool, into Surface Manager.

Text Formats in Surface Manager

Open the **Tools> Text Formats** menu.



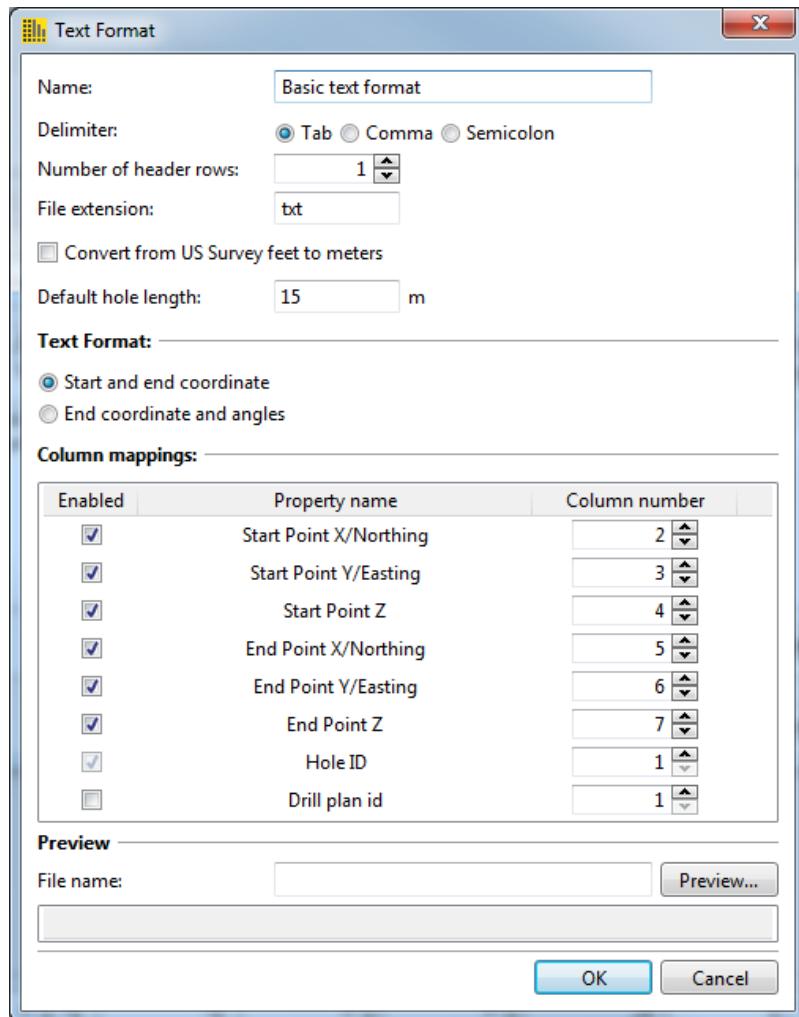
The available drill plan text formats are listed.

Click **Add** to add new drill plan text format.

Select a text format and click **Edit** to change an existing text format.

Select a text format and click **Delete** to delete the text format. The text format will be removed permanently.

Edit Drill Plan Text Format



Name

The name of the drill plan text format

Delimiter

Select the delimiter used in the text file. Default value for Basic text format is Tab.

Number of Header Rows

The number of rows ignored before the parsing of the text file starts. Default value for Basic text format is 1 which means that the first row in the file will be ignored.

File Extension

The file extension of the drill plan text file. The file extension must match the text file to be available in the preview dialog or import dialog (typically csv or txt).

Convert From US Survey Feet to Meters

Check this if the coordinate points in the text file are in US Survey feet.

Default Hole Length

When end point is omitted the value is used to calculate end point from start point.

Text Format

Convert from start XYZ and end XYZ or convert from end XYZ and calculate start XYZ using angles.

Enabled (Column Mappings)

When checked the property name is mapped to a column.

Property name (Column Mappings)

The name of the drill plan property.

Column Number (Column Mappings)

The order of the column to map. First column starts with 1.

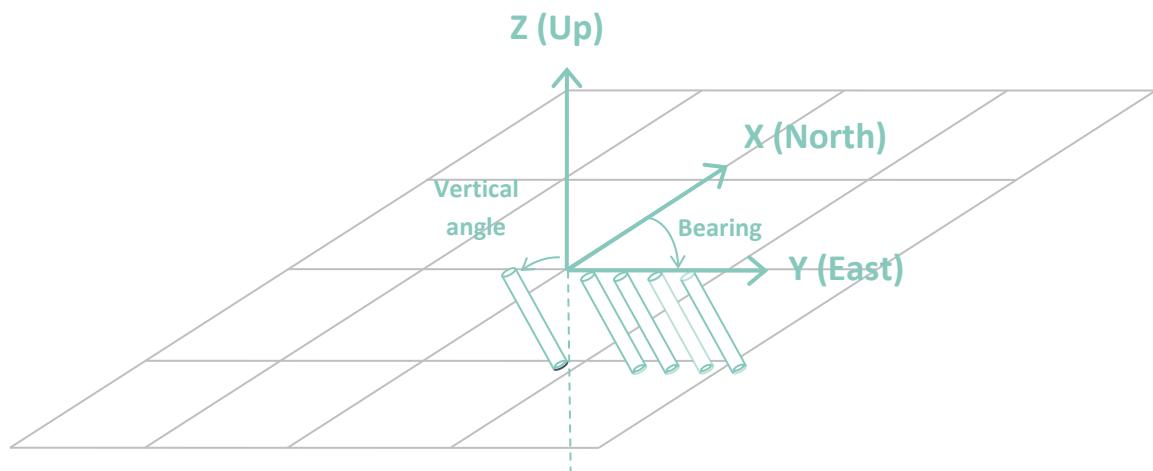
Drill Plan Text Format Preview

Click **Preview** and select a file to preview the mapping. Make sure the file extension matches the file to preview.

Click **OK** to apply changes or **Cancel** to undo any changes.

Drill Plan Text Format Coordinate System

Left hand coordinate system where X is pointing north, Y pointing east and Z is pointing up.



Bearing

0 degrees is pointing in positive X direction.

90 degrees is pointing in positive Y direction.

Vertical Angle

The angle between Z axis and hole vector described by start position in XY and end position in XY.

Users and Groups

Introduction

Surface Manager allows for different permissions for different users by assigning the users to security groups. When selected login method is *Surface Manager*, Security groups are assigned in the user dialog. When selected login method is *Active Directory*, users are assigned to security groups based on *AD Group Mappings*.

Different security groups can have permissions to different features in Surface Manager, and a user can be a member of multiple security groups.

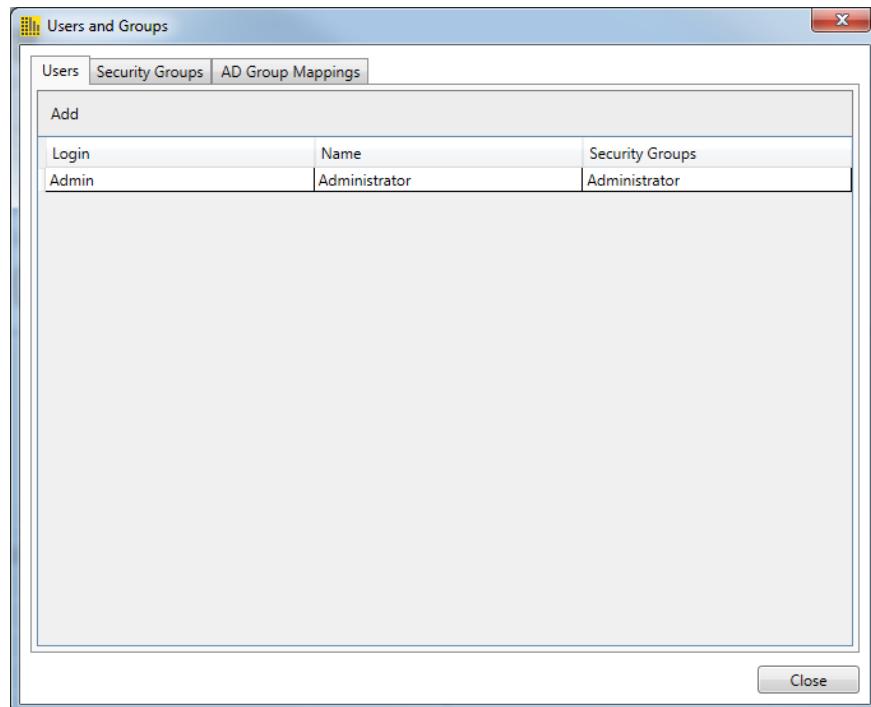
To open the **Users and Groups** dialog; select the **Tools> Users and Groups** menu.

Note: If the selected login method is *Surface Manager* it is also possible to log in as a guest. A guest do not have any permissions.

Users

Click on the **Users** tab.

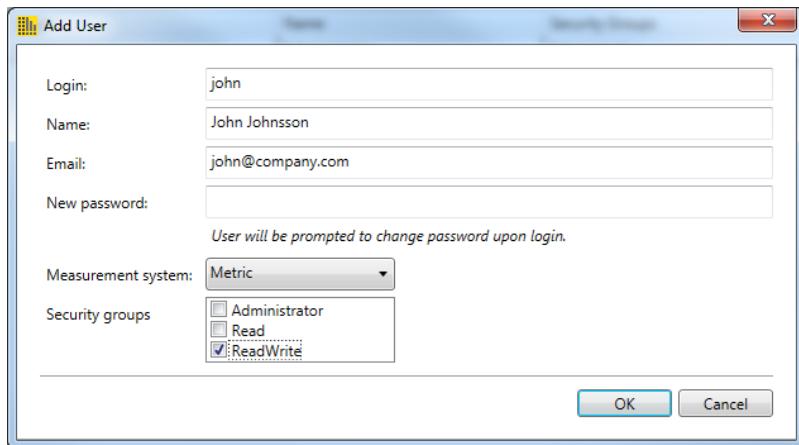
The current users are listed.



Add user

Note: Users can only be added when login method is Surface Manager. When login method is Active Directory users are created automatically on first log in.

Click **Add** in the tool bar.



Enter user information.

Login, name and e-mail are required. Password is optional.

When setting a password the user will be prompted for a new password after first log in.

Select measurement system.

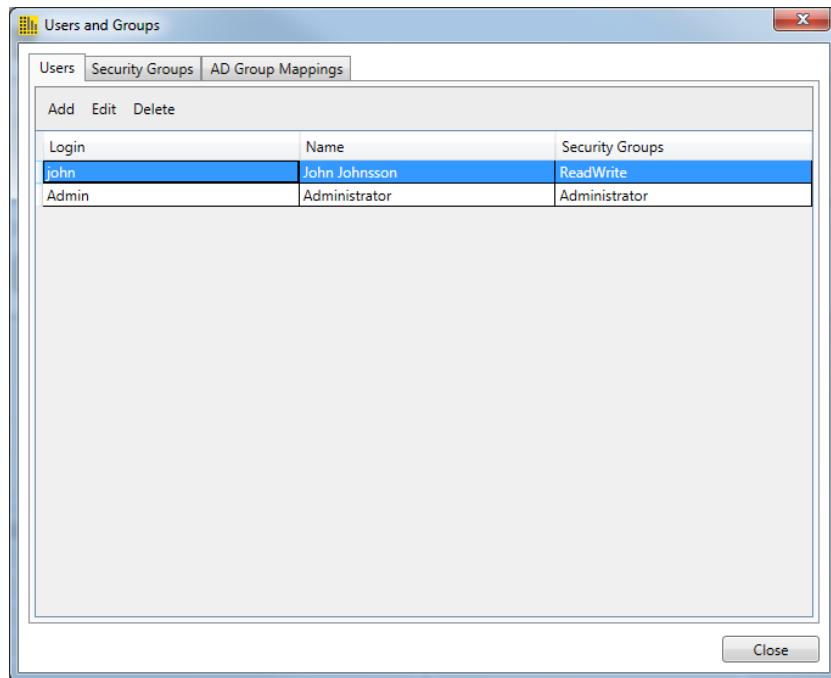
Select which security groups the user should be a member of. The user will get the permissions from all security groups combined.

Click **OK**.

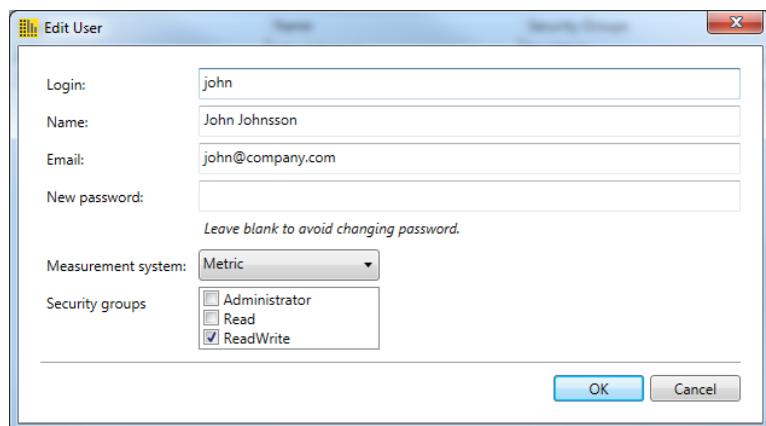
Edit user

Note: When selected login method is Active Directory, the only thing that can be changed is the **Measurement System**.

Select the user to edit in the list.



Click **Edit** in the tool bar.



Make the desired changes and click **OK**.

Delete user

Select the user to delete in the user list.

Click **Delete** in the tool bar.

Answer **Yes** in the confirmation dialog.

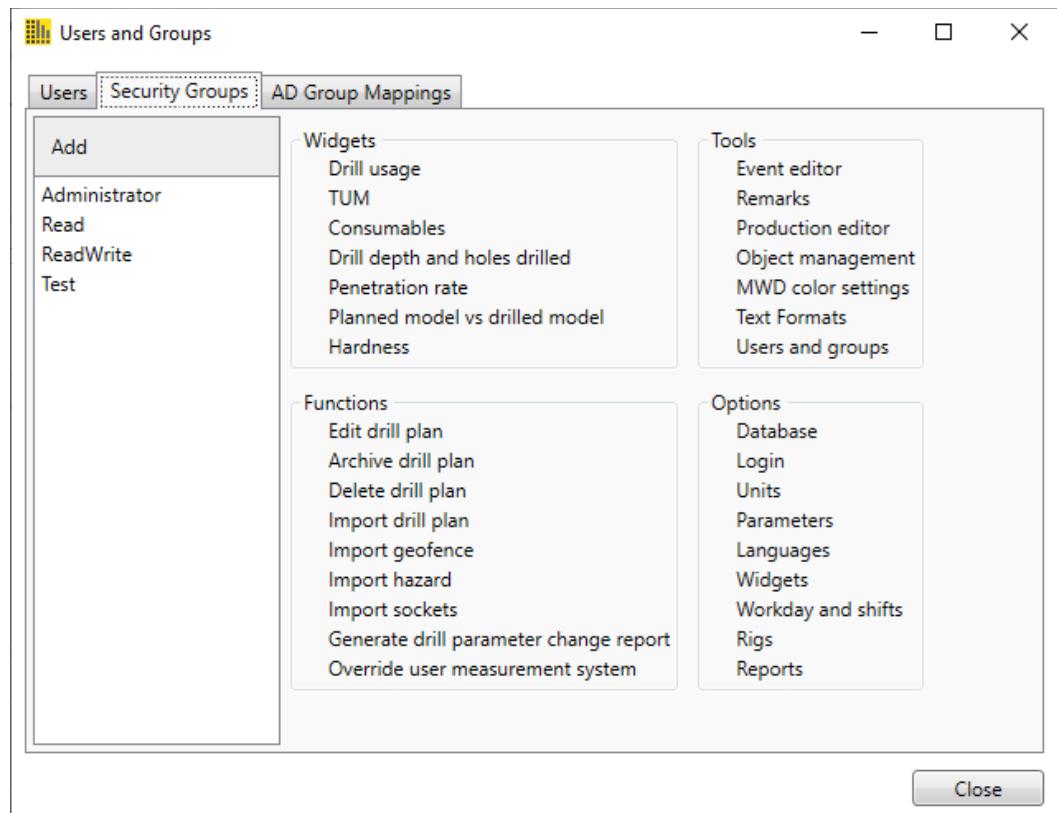
Note: There must always exist at least one user with administrator permission. The last user with administrator permission cannot be deleted.

Security Groups

Click on the **Security Groups** tab.

All security groups are listed.

Select a security group in the list to see a preview of all the permissions in the security group. A check mark in front of a permission means that that permission is set for that security group.



Note: The predefined Administrator security group has access to everything and cannot be edited or deleted.

Overview

Security groups defines permissions that can be assigned to users. Each security group can have a different set of permissions. A user can be a member of multiple security groups. A users permissions are the combination of all permissions in all security groups the user belongs to.

Permissions

Widgets

The different widget permissions allows the user to open the widget with the corresponding name, if that permission is set. Otherwise the user can only see the widget preview on the dashboard.

Tools

- Event editor – Allows the user to open the **Event Editor** dialog
- Remarks – Allows the user to open the **Remarks** dialog
- Production editor – Allows the user to open the **Production Editor** dialog.
- Object management – Allows the user to open the **Object Management** dialog.
- MWD color settings – Allows the user to open the **MWD Color Settings** dialog.
- Text Formats – Allows the user to open the **Text Formats** dialog.
- Users and groups – Allows the user to open the **Users and Groups** dialog

Functions

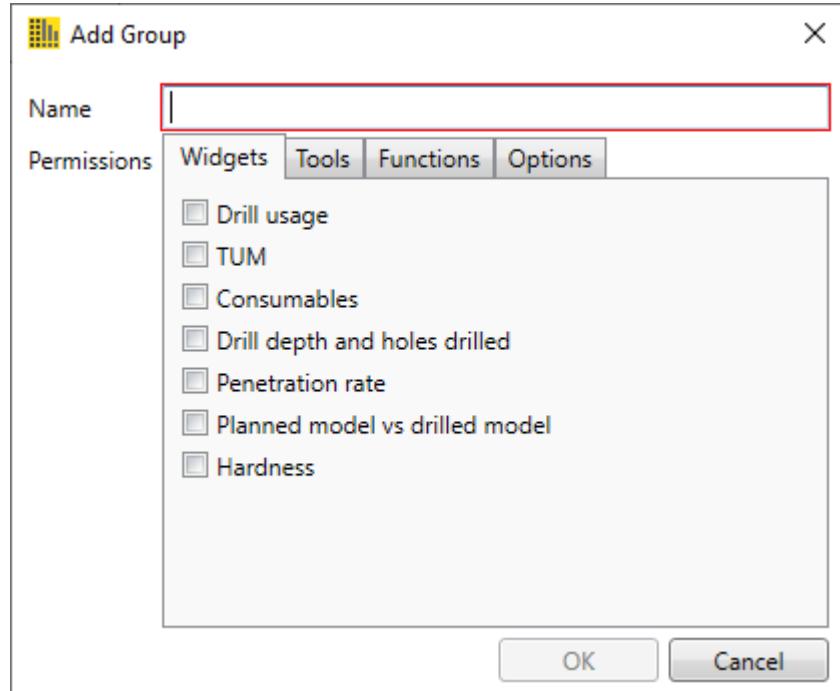
- Edit drill plan – Allows the user to open the Drill Plan Management widget and edit drill plans.
- Archive drill plan – Enabled the function to archive and unarchive drill plans in the Drill Plan Management widget.
- Delete drill plan – Enables deletion of drill plans in the Drill Plan Management widget.
- Import drill plan – Enables import of drill plans in the Drill Plan Management widget.
- Import geofence – Enables import of geofence templates in the Drill Plan Management widget.
- Import hazard – Enables import of hazard templates in the Drill Plan Management widget.
- Import sockets – Enables import of sockets in the Drill Plan Management widget.
- Generate drill parameter change report – Enables generation of drill parameter change report from the **File** menu.
- Override user measurement system – When set, the user can select to override the measurement system setting for all users, in the options dialog.

Options

The different options permissions allows the user to view and change the tab with the corresponding name in the options dialog.

Add security group

Click **Add** in the tool bar.



Enter name and select desired permissions in the different tabs.

Click **OK**.

Edit security group

Select the security group to edit in the list.

Click **Edit** in the tool bar.

Complete the desired changes.

Click **OK**.

Delete security group

Select the security group to delete in the list.

Click **Delete** in the tool bar.

Click **Yes** in the confirmation dialog.

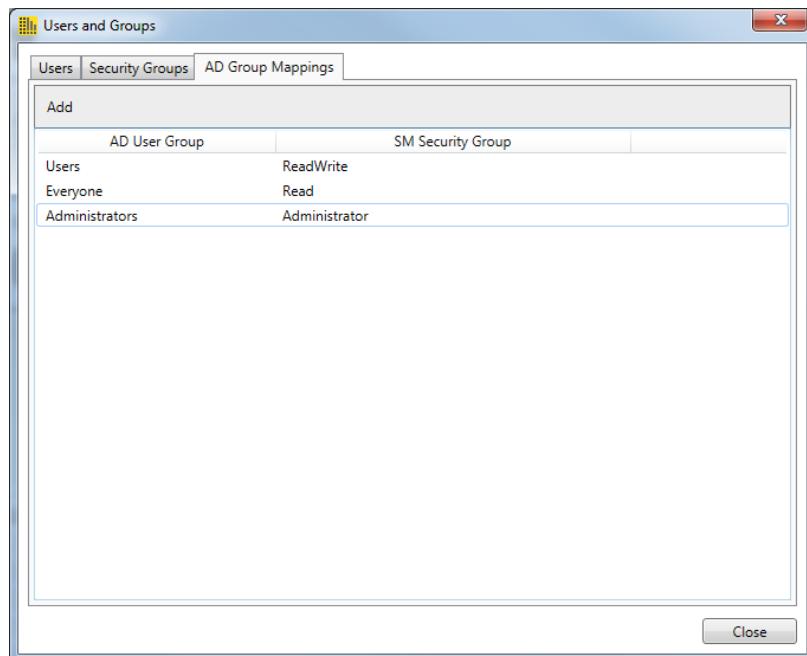
AD Group Mappings

To use the Active Directory login method, mappings must be created between Surface Manager Security groups and Active Directory groups. All Windows users that are members of the Active Directory group gets the permissions set in the mapped Surface Manager Security group when using Surface Manager.

Overview

Click on the **AD Group Mappings** tab.

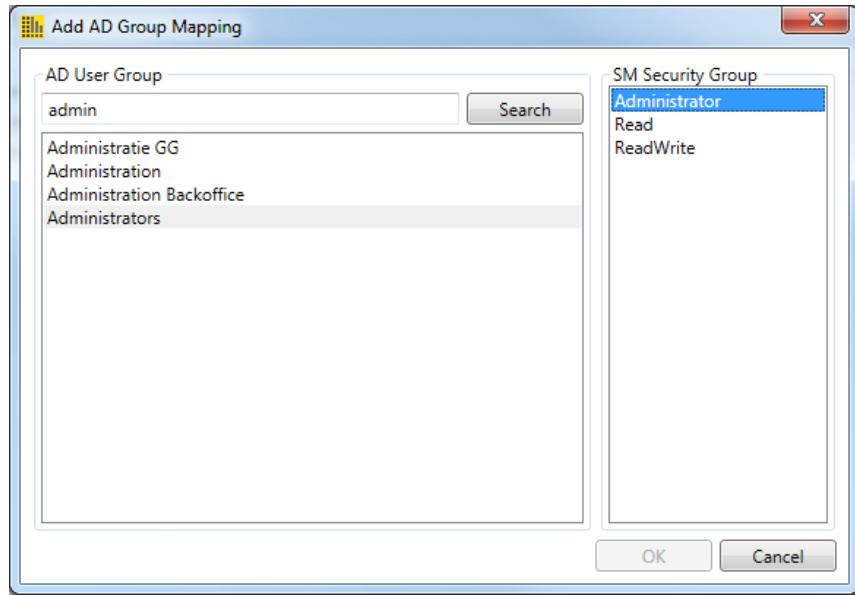
The Active Directory group and the mapped Surface Manager Security group are listed together.



Note: The last mapping that is mapped to the Administrator security group cannot be edited or deleted. One mapping to the Administrator security group must always exist.

Add mapping

To add a new mapping click **Add** in the toolbar, a new dialog is shown.



Start by searching for the Active Directory group the mapping should be added for. All groups that begin with the entered text will be shown.

Select the Active Directory group in the **AD User Group** list.

Select the Surface Manager Security group in the **SM Security Group** list.

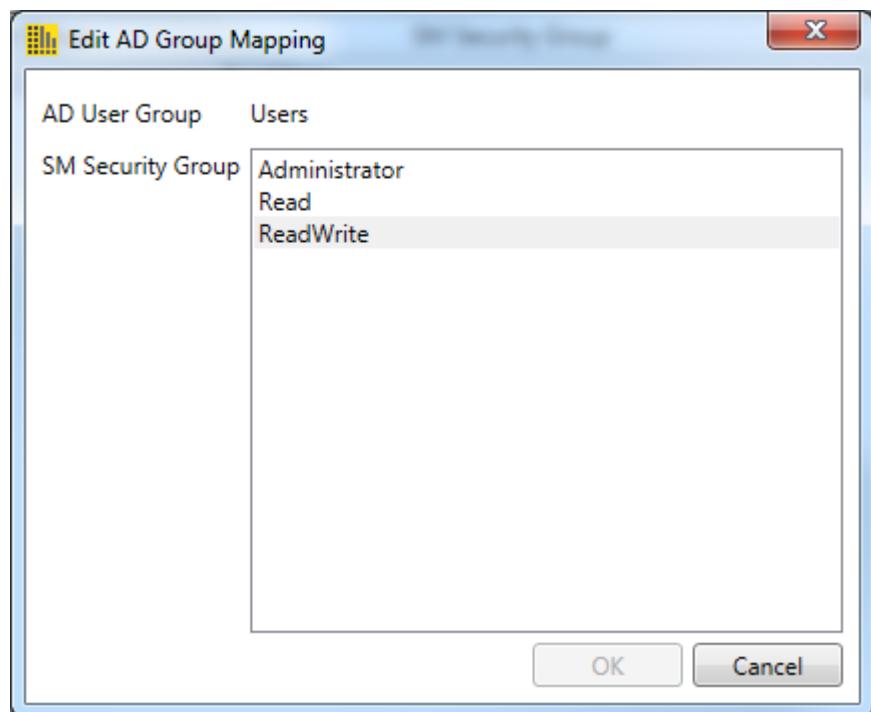
Click **OK**.

The mapping is added and all users that are a member of the Active Directory group gets the permissions that are set in the Surface Manager Security group.

Edit mapping

Select the mapping to edit.

Click **Edit** in the tool bar.



Only security group can be changed. Select new security group.

Click **OK**.

Delete mapping

Select the mapping to delete in the list.

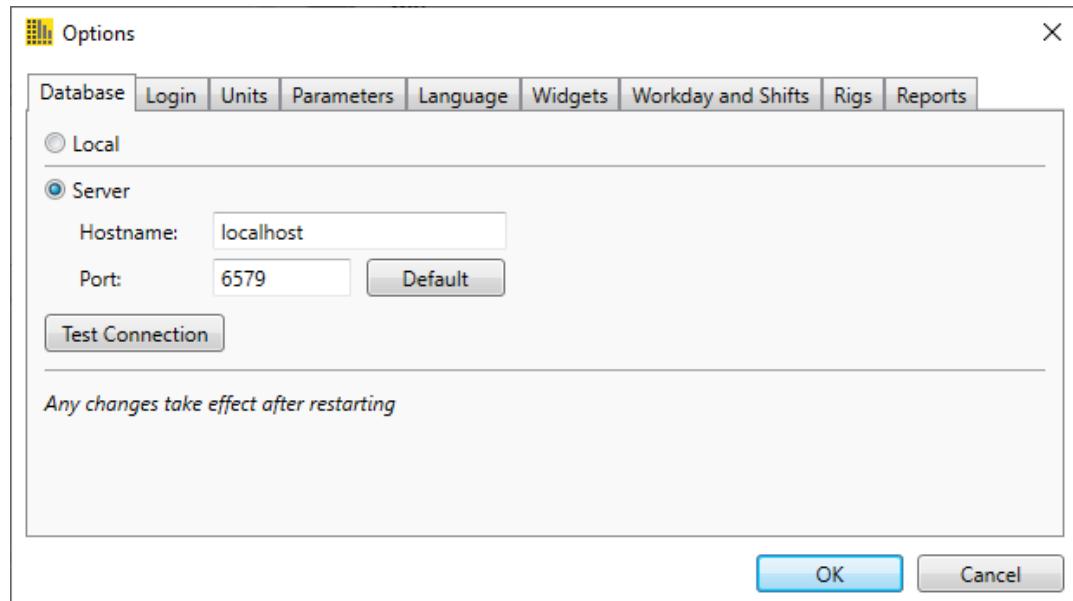
Click **Delete** in the tool bar.

Click **Yes**, in the confirmation dialog.

Options

Database

Open the **Tools> Options> Database** menu.

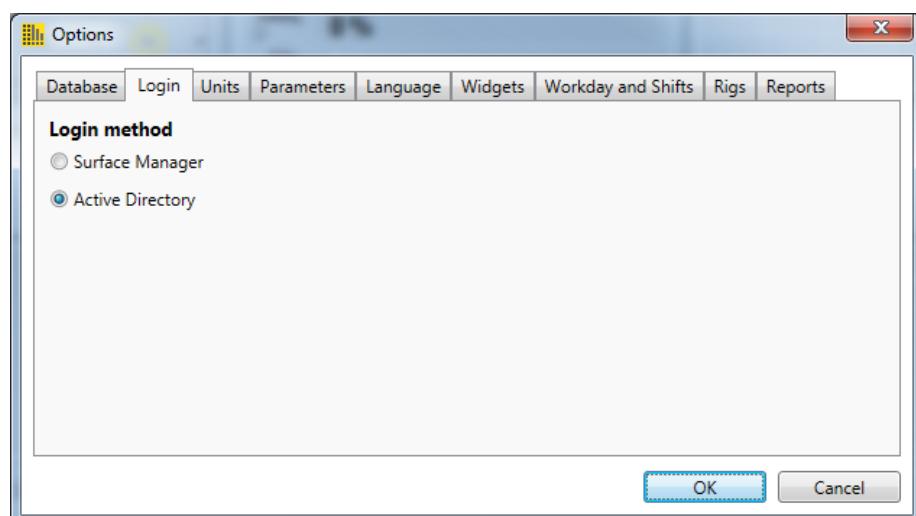


Change database

Select *Local* or *Server*. Any changes take effect after restarting.

Login

Open the **Tools> Options> Login** menu.



Select *Surface Manager* or *Active Directory*.

Surface Manager

When Surface Manager is selected as login method, Surface Manager will handle the users. When starting Surface Manager a login dialog will be shown where the credentials can be entered.

Active Directory

When Active Directory is selected as login method, Active Directory will be used to handle users. When starting Surface Manager the currently logged in user in Windows will be used to log in, no credentials needs to be entered.

The users will get permissions in Surface Manager depending on which groups they are members of in Active Directory.

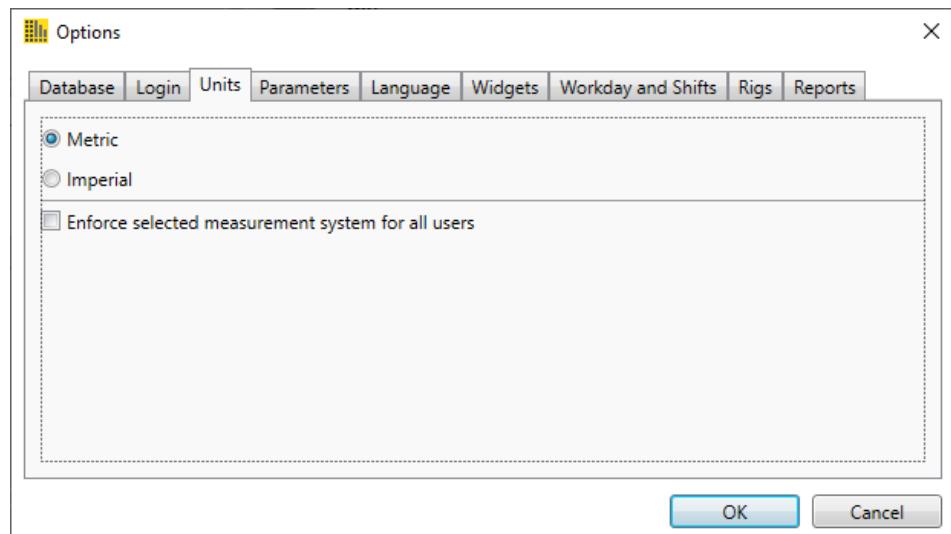
If the currently logged in user do not have permission to use Surface Manager, a login dialog will be shown. Permissions are decided based on mappings between Surface Manager Security groups and Active Directory groups.

See **AD Group Mappings**, page 141. To log in as a different user than the currently logged in Windows user, use the shortcut *Start Surface Manager as different user* on the start menu.

Note: A mapping must exist between the Administrator security group and an Active Directory group in order to change login method to Active Directory.

Units

Open the **Tools> Options> Units** menu.



Select *Metric* or *Imperial*.

Enforce selected measurement system for all users

Check this box to enforce measurement system for all users. This setting is only visible when having administrator security level.

Parameters

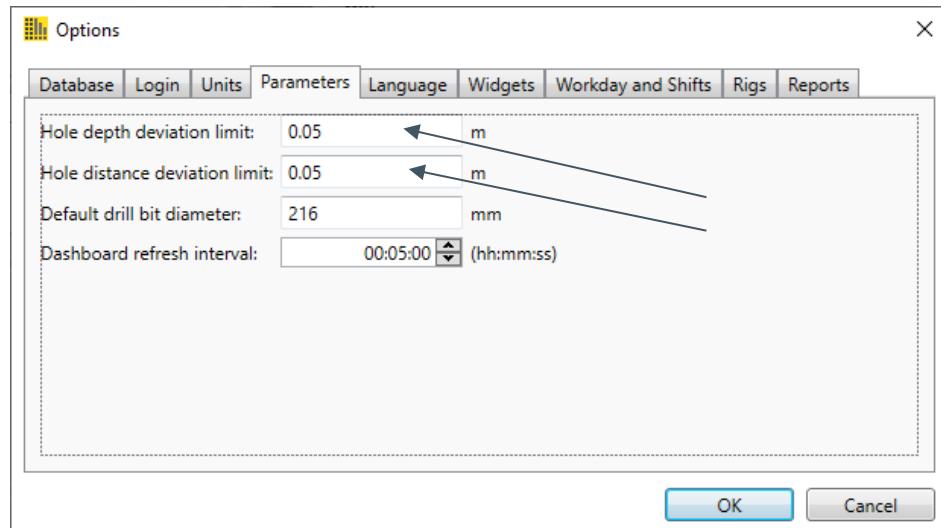
The parameters for *Hole depth deviation limit*, *Hole distance deviation limit*, *Default drill bit diameter* and the *Dashboard refresh interval* can be set.

Open the **Tools> Options> Parameters** menu.

Edit the hole depth deviation limit and distance deviation limit

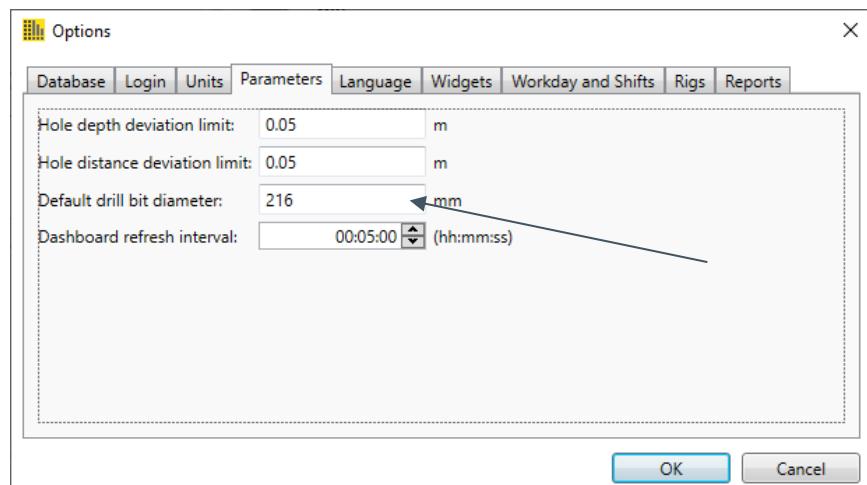
Update the **Hole depth deviation limit** and **Hole distance deviation limit**.

Click **OK**.



Edit default drill bit diameter

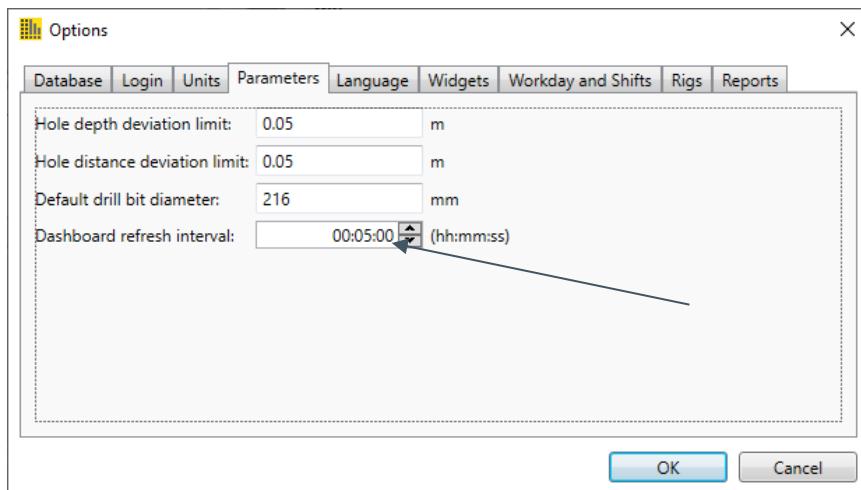
Set the **Default drill bit diameter**.



Click OK.

Edit dashboard refresh interval

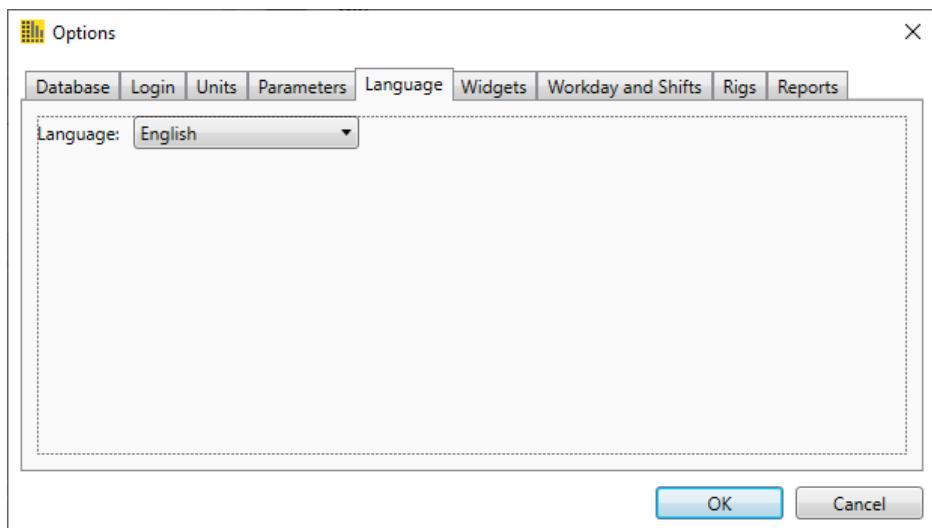
Set the elapsed time before an automatic refresh of the dashboard occurs.



Click OK.

Language

Open the Tools> Options> Language menu.



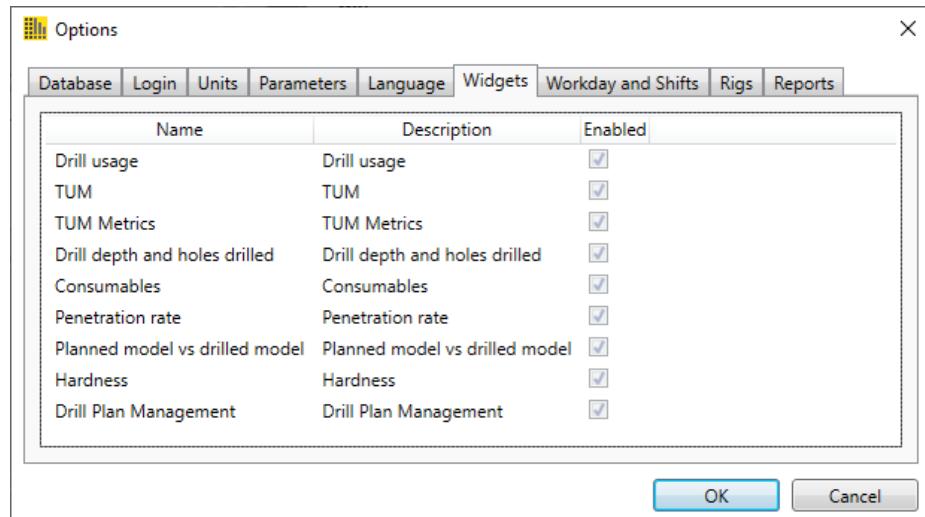
Select the desired language.

Click OK.

Note: A restart is required for a language change to take effect.

Widgets

Open the **Tools> Options> Widgets** menu.



Workday and shifts

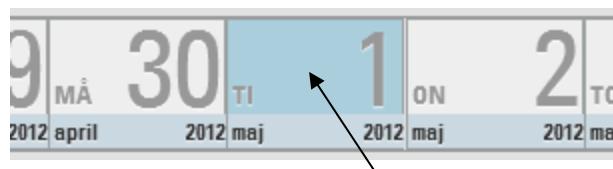
The workday and shifts affect the date selection in the calendar.

Open the **Tools> Options> Workday and shifts** menu.

Workday start

Workday start time is used in combination with the calendar when retrieving data for the selected date(s).

E.g. Workday start time is set to 07:00. Calendar date is set to 1st May. The workday starts May 1st 07:00 and ends May 2nd 07:00.

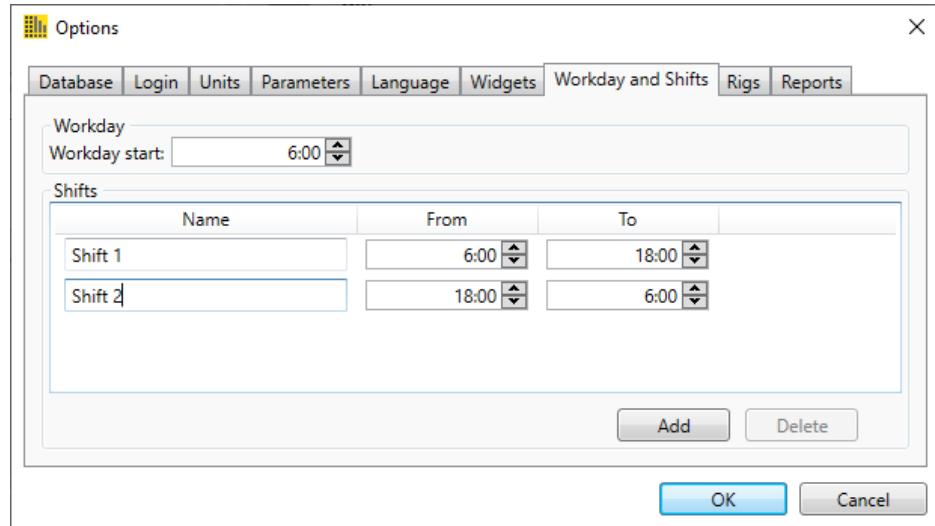


Shifts

Click **Add** to add a new shift.

Select a shift and click **Delete** to remove the shift.

The shift properties *From* and *To* define how the time is set in a workday when selecting a shift.

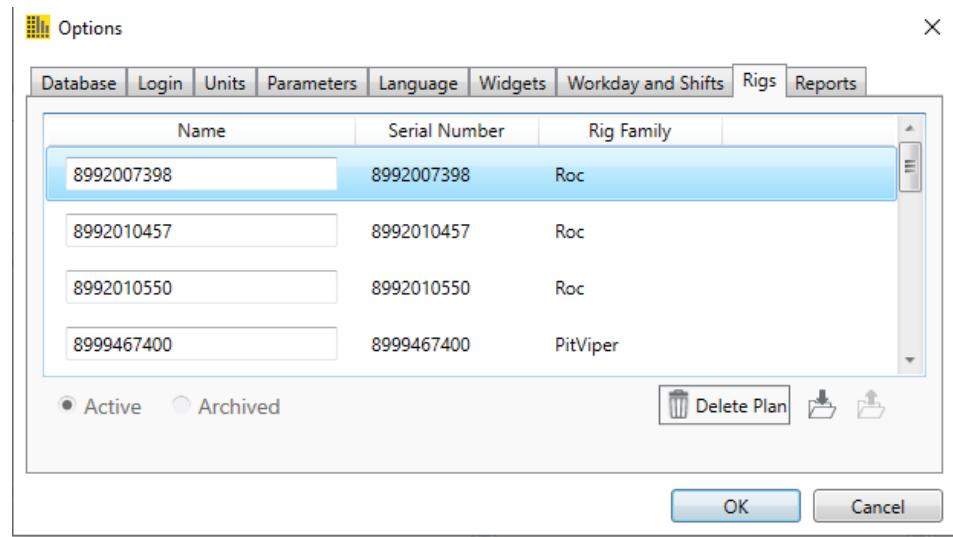


E.g. *Workday start* is set to 06:00. A shift “Night” ranges from 06:00PM to 06:00AM. Calendar date is set to 1st May. “Night” is selected. “Night” starts 1st May 06:00PM and ends 2nd May 06:00AM.



Rigs

Open the Settings > Options > Rigs menu.



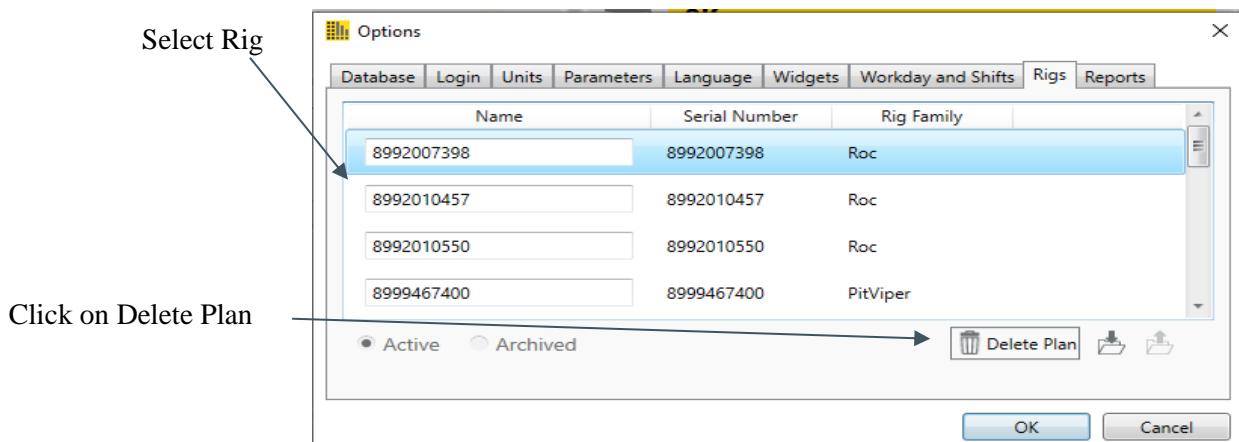
Rename rig

The rig name defaults to the rig serial number. Change the rig name and the rig name will show on the dashboard.

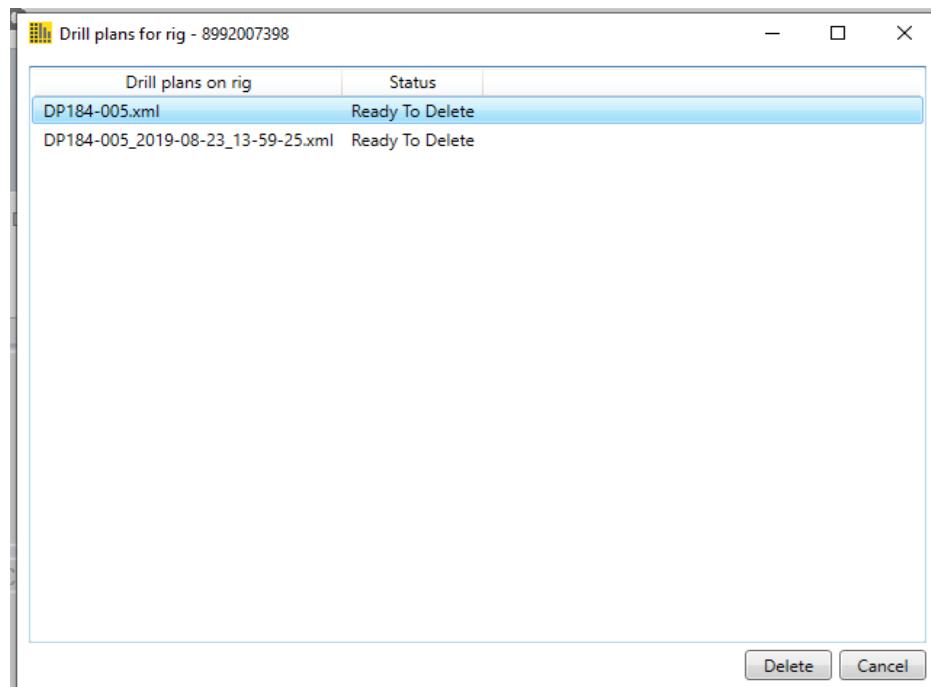
Delete Plan from rig

Some of the drill plans on the rigs will become obsolete with time. These plans have to be removed from the rig.

Gives the user an option to delete rig plan from Surface Manager using RRA



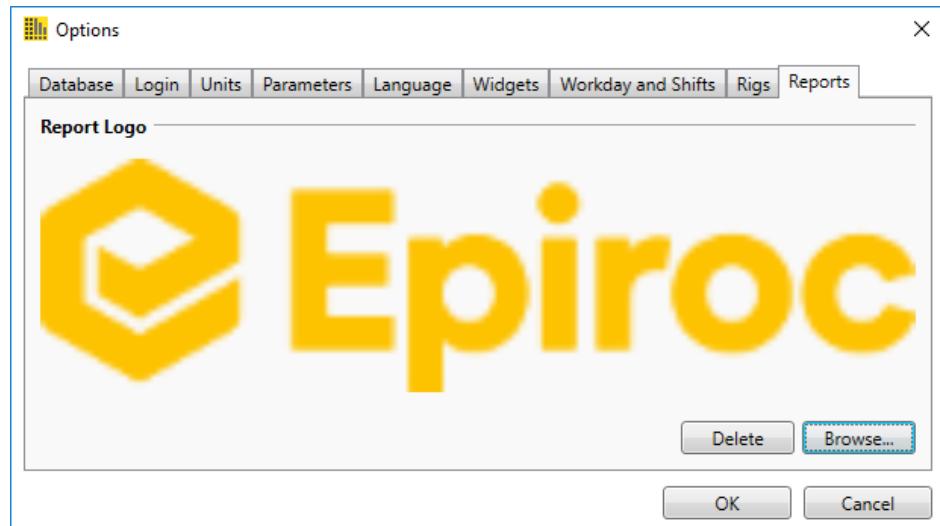
Once the user clicks on the Delete Plan button, Screen opens up with the Drill plans present in the selected rig's on machine folder.



Select the Drill plan you wish to delete and Click on Delete. This will delete the drill plan from the Rig using RRA.

Reports

Open the **Tools> Options> Reports** menu.



Set custom logo

Click **Browse...** and select your image file.

The logo will be printed on all reports in the top-left corner. The printed width will be 3 cm or approximately 1.2 inches. The height will be adjusted automatically to follow image aspect ratio.

Recommended height is 1/3 of width.

To print logo in 300 dpi, set logo image width to 350 pixels.

To print logo in 600 dpi, set logo image width to 700 pixels.



Drill depth and holes drilled

1/1/2015 6:00:00 AM - 2/1/2015 5:59:59 AM

