

- when it has to be **right**



# Leica MC1 v6.6.1

## Software Release Notes

**Product:** Leica MC1

**Date:** 20/06/2023

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These release notes contain essential information about:

Software	Version
Leica MC1	6.6.1
Download	<a href="https://myworld.leica-geosystems.com/irj/portal">https://myworld.leica-geosystems.com/irj/portal</a>

Leica MC1 Software is protected and can only be loaded onto instruments with a valid software maintenance date.

**IMPORTANT Notes:**

- Versions prior to Leica MC1 6.3 will not be supported by iCON gps80 instruments running v6.7.10.
- General rule regarding backups: please always make sure to back up every time you upgrade or downgrade versions of MC1.
- Please avoid using special characters for naming of Create Model, Point codes etc. We cannot guarantee these special characters will not damage/affect your USB and ConX synchronization.
- New Installer Password:
  - Demo: ipm0
  - Installer: iODE
  - Site Manager: i007 & iMAN
- Password for connection to VNC (First connection only):
  - iVNC
- Calibration dimensions have changed from 6.4.2/6.5.0.1 Excavator, downgrading from a new machine to 6.4.1 or below will require re-calibration.
- Please note that semi-auto excavators will require re-calibration of hydraulics after updating to 6.6.1 if they upgrade from a 6.4.x version or older.
- Version on CB14 is: v2.92

**Please take your time to read these release notes!**

The release notes contain information about the new Leica MC1 machine software.  
Please read the release notes in conjunction with the user's manual delivered with every instrument.

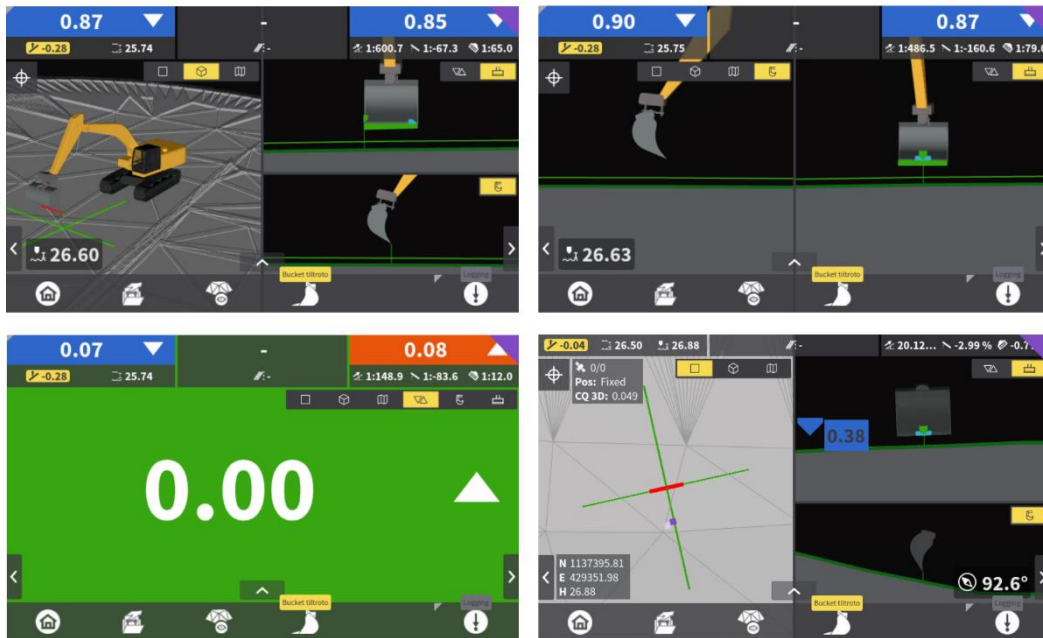
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## 1. Platform new features and improvements

### 1.1 General platform improvements

#### 1.1.1 Customizable run screen views

- Tap to toggle through selected run screens in each view "window"
- All custom run screens for different solution types available for selection in respective solutions
- Users' selection remains saved when toggling through different run screens

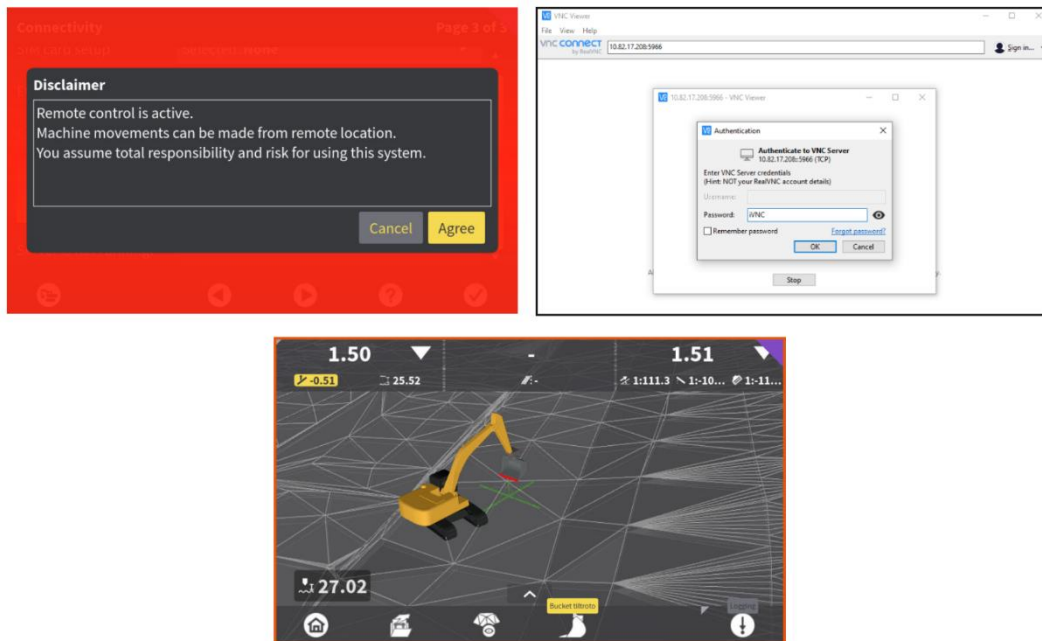


#### 1.1.2 CB14 view available in Dozer/Grader



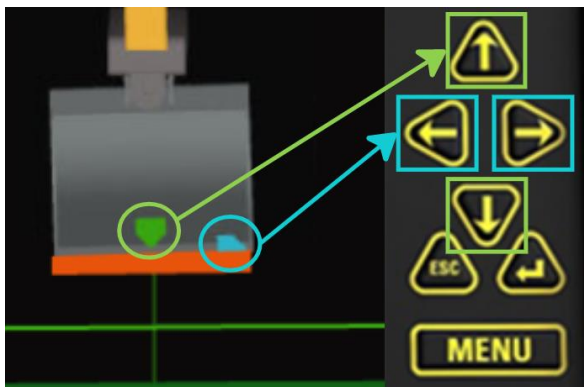
### 1.1.3 VNC remote control for all Solutions

- Additional warning text and disclaimer when VNC is activated
- Visual red border in all MC1 screens when VNC is active
- Password: ivnc



### 1.1.4 Changes to HW button behaviour for tool selection

- Up and Down (Height reference tool selection)
- Left and Right (Side reference tool selection)

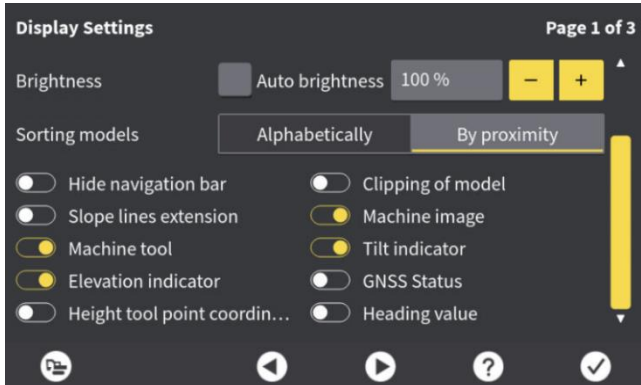


### 1.1.5 UI and Icon Changes

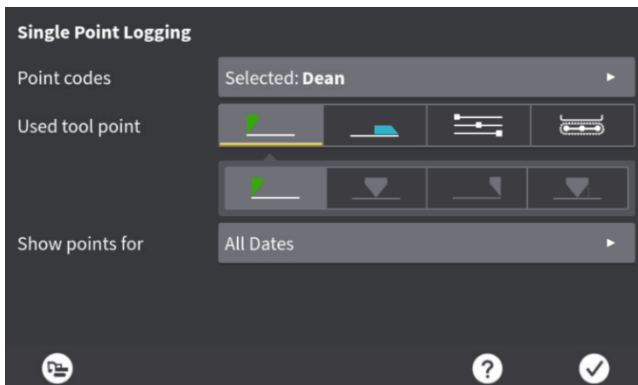
- Home button on run screen + individual machines replacing the “X”



- Addition of toggle buttons in display settings. This will be continued to be rolled out throughout the software

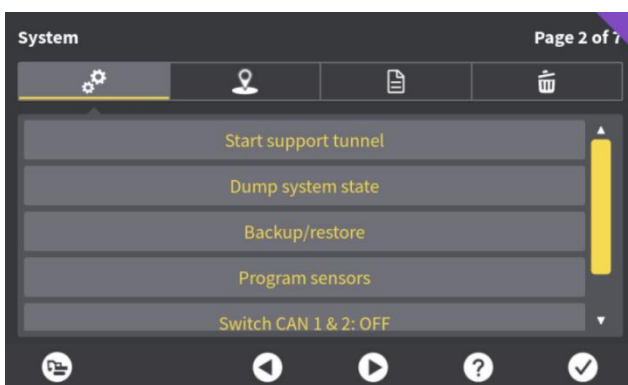


- Single point logging tool point selection icons now have colour based on height and side reference



### 1.1.6 System page improvements upgraded

- The systems page has had the addition of tabs to make the page more manageable

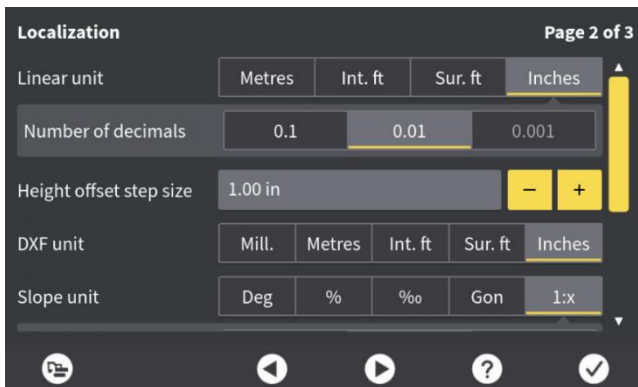


### 1.1.7 QR Codes introduced in “About Page”

- Access how-to videos

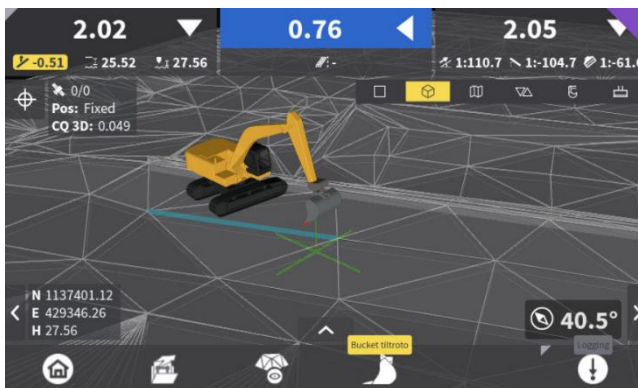
### 1.1.8 Inches added as unit throughout the software

- Inches can now be selected as a
  - Linear unit
  - DXF unit
  - Slope unit



### 1.1.9 Run screen widgets ON/OFF

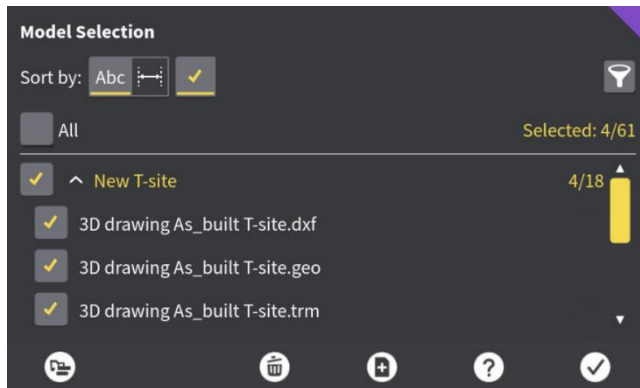
- ON/OFF GNSS Status
- ON/OFF N, E, H widgets in run screen (Elevation and N, E, H are exclusive)
- ON/OFF Heading Value widget in run screen
- Actual cross slope vs cross slope to model for cross slope indicator





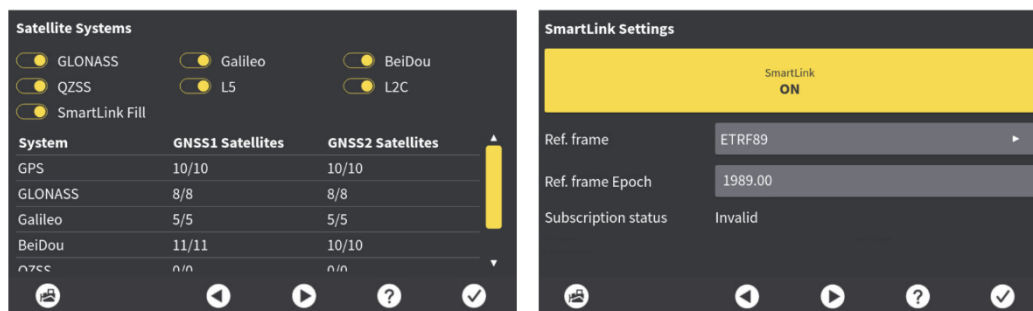
### 1.1.10 Model selection & filter improvements

- Select/Deselect all models
- Sort by, all selected models
- Visualize number of models vs number of models selected



### 1.1.11 New iCA202 support

- SmartLink (PPP)
- QZSS
- SBAS



### **IMPORTANT:**

For SmartLink to properly work on iCA202 FW ver. 2.0.0 you will need on MC1 side:

- Delete all profiles
- Restart MC1
- Create new SmartLink profile

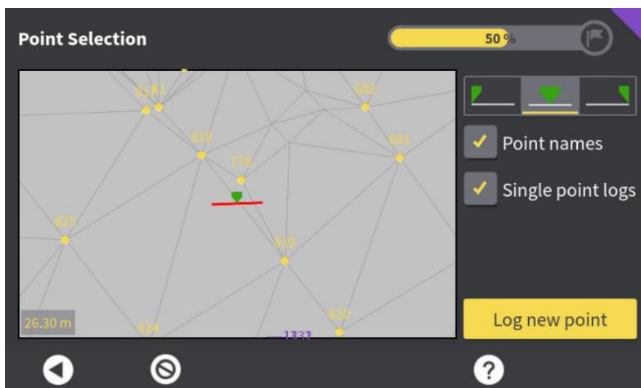
In the case of changing between multiple SmartLink profiles you will need to restart MC1-iCA202 so that the settings for the SmartLink profile are sent to the receiver. After restart creation and editing of any new profile will work.



## 1.2 Create Model Improvements

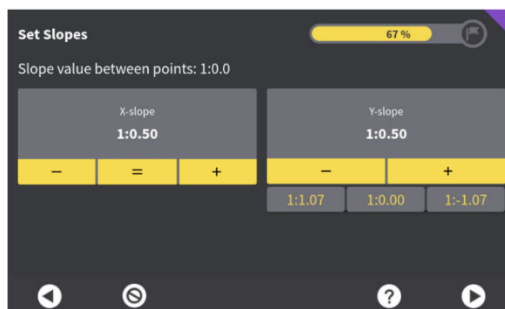
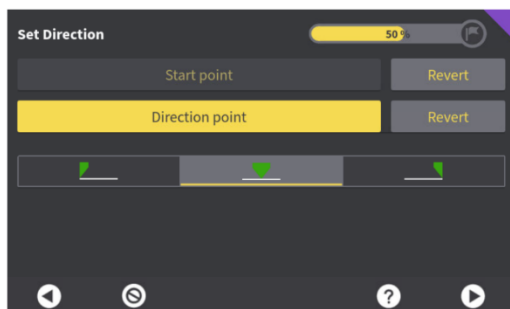
### 1.2.1 Press and hold to edit points and tool point now visible

- Press and hold for edit points in all model creation wizards
  - Existing as-builts Height can only be edited
  - Newly logged points created within the wizard can have their N, E, H edited.
- Tool cutting edge now visible in the create model setup and tool point selectable (left, centre, right)
  - Added for all screens where measurement with the tool point is possible
  - For guidance and visualization of the tool point selected
  - Tool point indicator always on the top of the cutting edge to assist with direction



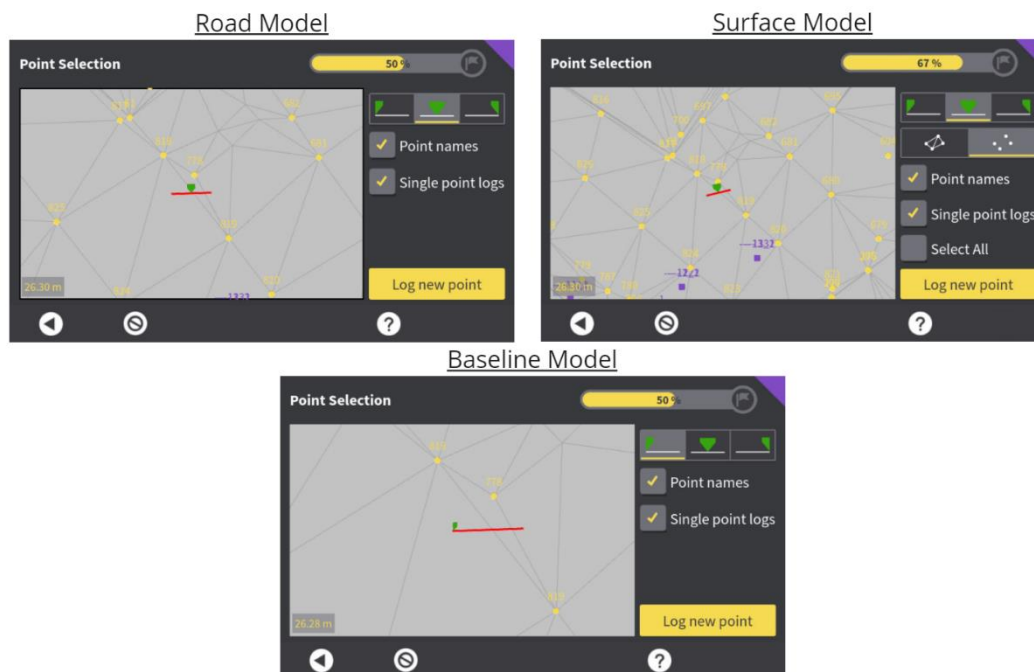
### 1.2.2 Measure two points workflow change

- Reworked workflow that is more intuitive
  - Start point and direction point
  - Possibility to use your measured points to get the X-slope for your design



### 1.2.3 Unified UI for create model wizards + updated help text throughout wizards

- Surface Model
- Road Model (*All points now selectable own and imported*)
- Baseline Model
- Updated help text and images throughout Create Model wizards



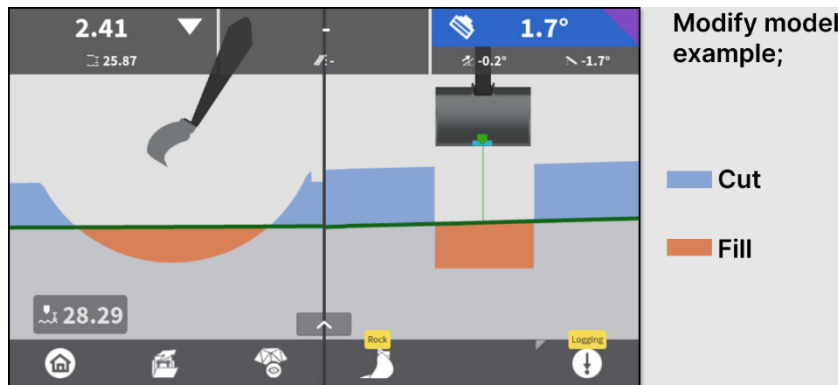
## 2. Surface Logging – Modify Models for earthmoving

Machines affected:

- Excavator
- Dozer
- Grader

Surface logging description:

- When activated, MC1 will log the machine's tool path resulting in a surface log
- The surface log can be displayed on the 3D and top view run-screens
- The modify model is displayed in the cross and long slope run screens
- Modify model in the cross and long slope screens display the cut fill colours set by the operator

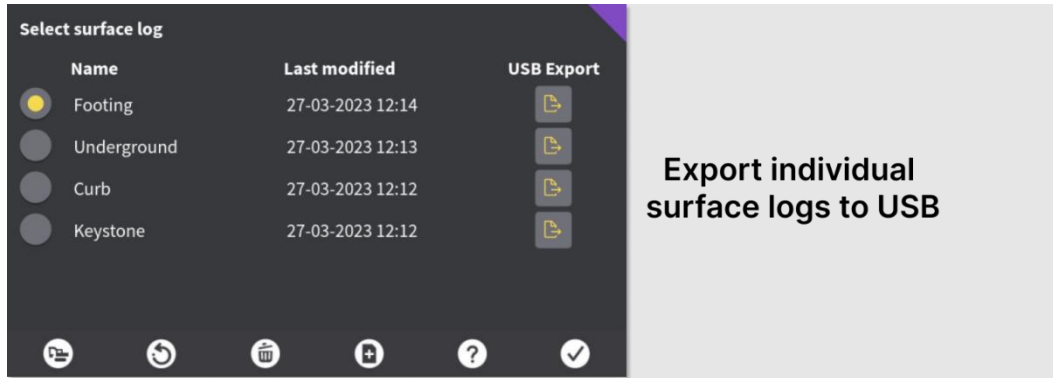


- Surface log to target height will be indicated by using a heatmap style colouring on the surface log
- Size limitation for surface logs in 6.6 is 100m radius from the tool point at the time of creating the surface log (this limitation will be removed in an upcoming MC1 release)
- Surface logs are created and named by the operator

- A choice of trigger methods will activate surface logging.
  - Log in auto/semi auto
    - Surface logging is active when the blade/tool is controlled by MC1
    - Surface logging will automatically activate/deactivate to follow the auto functionality
    - The last pass is logged
  - Height trigger
    - Set a distance perpendicular to the height reference model
    - The height trigger is modified with every tool pass below this level
    - Surface logging will automatically actively log below this height
    - The modified sections become the new trigger
    - Visualisation of the modify model are displayed in the run screen to guide the operator
    - The lowest pass is logged
  - Model trigger
    - The operator selects a model from the project as a trigger
    - Models created on MC1 can also be used as a trigger
    - The trigger model is modified with every tool pass below the surface of the modify model
    - Surface logging will automatically actively log below this model
    - The modified sections become the new trigger
    - Visualisation of the modify model are in the run screen to guide the operator
    - The lowest pass is logged
  - Manual trigger
    - Manual activation of surface logging is supported with any trigger configuration
    - Manual activation is useful to correct an overcut situation
    - Excavator can have an external button configured for manual triggering
    - The operator must activate/deactivate surface logging
    - The last pass is logged

## 2.1 *Sync/export of surface logs*

- Surface logs can be synced to ConX (Machine to machine sharing of surface logs is not currently supported)
- Surface logs can be exported (no import functionality) to USB in a PTS and TIFF format
  - The conversion of the surface log to the export format can take up to 15 minutes at the time of export



## 2.2 *Upgrading from 6.5.x.x for surface logging*

### **IMPORTANT:**

Surface logs created on 6.5.x.x will be stored on the panel but will not be able to be used in 6.6.x. Syncing of surface logs prior to upgrading is recommended to reduce the risk of data loss.

## 2.3 *Creating surface logs*

- Main menu > As-built > Surface logging > Surface log > Add icon (F4):
- Naming of the surface log is mandatory
- The surface log name must be unique
- Select the following trigger methods:

- **Log in auto**
  1. Add name
  2. Select auto
  3. Complete the wizard

The screenshot shows the 'New surface log' wizard with a progress bar at 100%. The 'Surface log name' field is labeled with a red '1' and contains the text 'Name surface log'. The 'Trigger' dropdown is labeled with a red '2' and has 'AUTO' selected. A message box states: 'Log in auto will log the last tool pass.' At the bottom, there are icons for back, help, and a red '3' next to a flag icon indicating completion.

- **Height trigger**
  1. Add name
  2. Select trigger by height
  3. Set trigger height
  4. Complete the wizard

The screenshot shows the 'New surface log' wizard with a progress bar at 100%. The 'Surface log name' field is labeled with a red '1' and contains the text 'Name surface log'. The 'Trigger' dropdown is labeled with a red '2' and has 'HEIGHT' selected. The 'Trigger to height reference' field is labeled with a red '3' and contains the value '1.00 m'. A message box states: 'Trigger by height will record the lowest pass. In order to log the last pass use manual activation.' At the bottom, there are icons for back, help, and a red '4' next to a flag icon indicating completion.

- **Model trigger**
  1. Add name
  2. Select model trigger
  3. Select a trigger model
  4. Complete the wizard

The screenshot shows the 'New surface log' wizard with a progress bar at 100%. The 'Surface log name' field is labeled with a red '1' and contains the text 'Name surface log'. The 'Trigger' dropdown is labeled with a red '2' and has 'MODEL' selected. The 'Trigger by surface' field is labeled with a red '3' and contains the text 'T-site Odense Road Simris.xml'. A message box states: 'Trigger by surface will record the lowest pass always. In order to use last pass use manual activation.' At the bottom, there are icons for back, help, and a red '4' next to a flag icon indicating completion.

## Surface logging functionality

The following surface log functions are unchanged from version 6.5.01, for further information please refer to the 6.5.01 release notes.

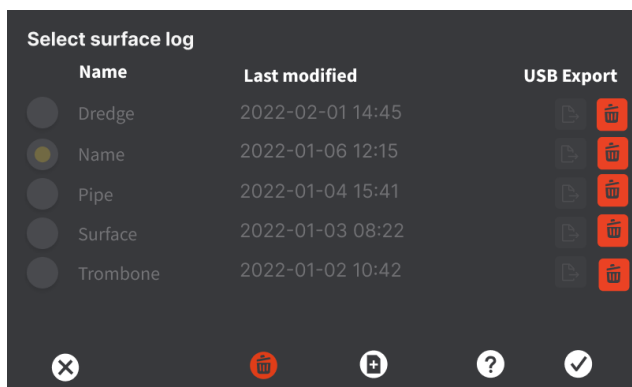
- The operator can change surface log colours and the distance between colour changes
- Putting surface logging in to standby mode
- Manual activation
- Visualisation ON/OFF in the command centre
- ConX syncing of surface logs (to ConX only and not synched back to the machine)

Functions that are planned for the next release for surface logging.

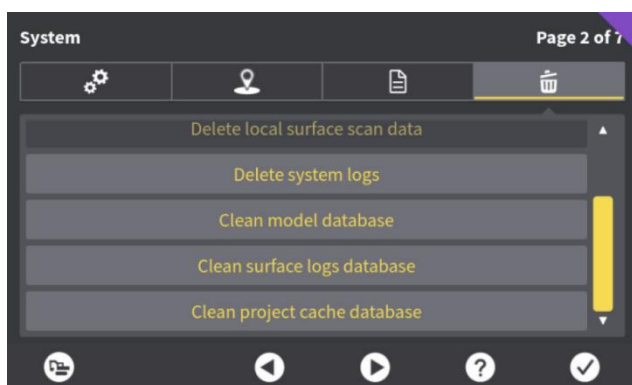
- Large and small grid visualisation
- Modify model in the 3D run screen
- Surface log transparency
- Machine – ConX – Machine surface log sharing

### 2.4 *Managing surface logs*

- Deleting surface logs
  - Main menu > As-built > Surface logging > Surface log > Trash can (F3) > Select the surface log to delete



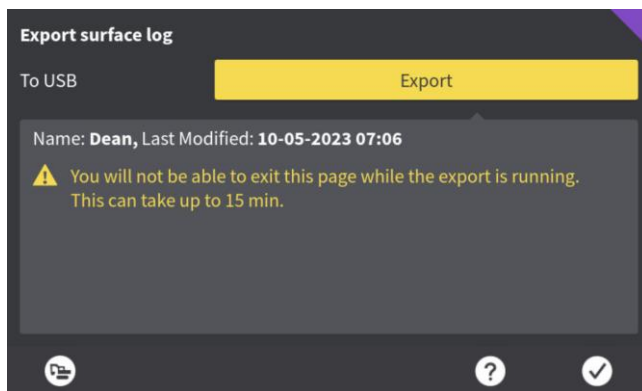
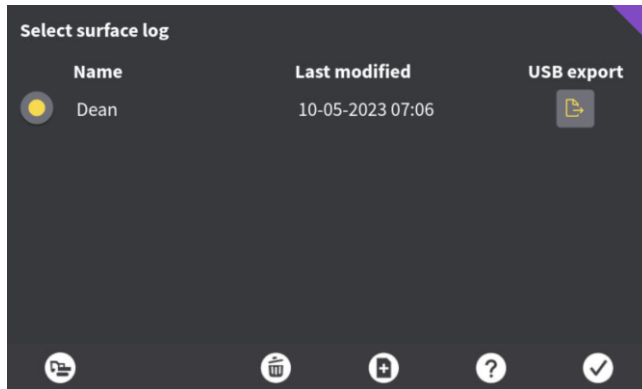
- Cleaning the surface log database
  - In the system page there is a new clean database button
  - User permission = Installer





## 2.5 *Export of surface log to USB*

- Export surface log to USB:
  - Export format = PTS and GEOTIFF
  - USB must be detected by MC1 to enable the export buttons

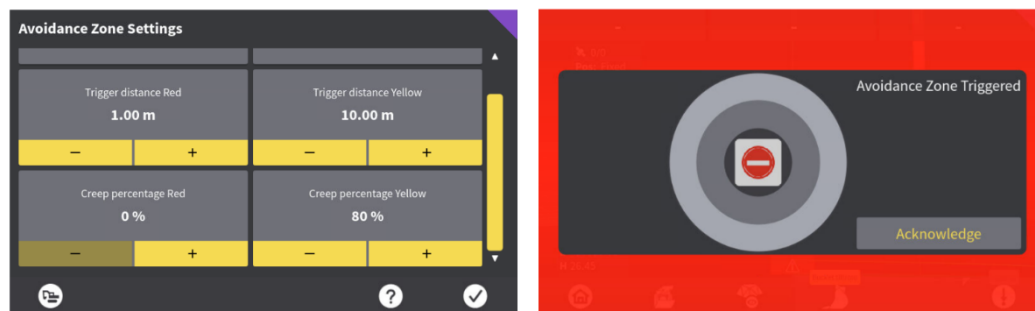


### 3. Earthmoving

#### 3.1 Excavator

##### 3.1.1 3D Avoidance Zones with Xwatch proportional hydraulic control (Excavator Only)

- Proportional percentage ramp down towards an avoidance zone, based on yellow distance
- Proportional percentage ramp up away from an avoidance zone, based on yellow distance
- Automatic stop when reaching the red distance, based on the avoidance model selected
- Detailed information can be found in the application note at: <https://myworld.leica-geosystems.com/irj/portal> under the Awareness Solutions folder in myDownloads

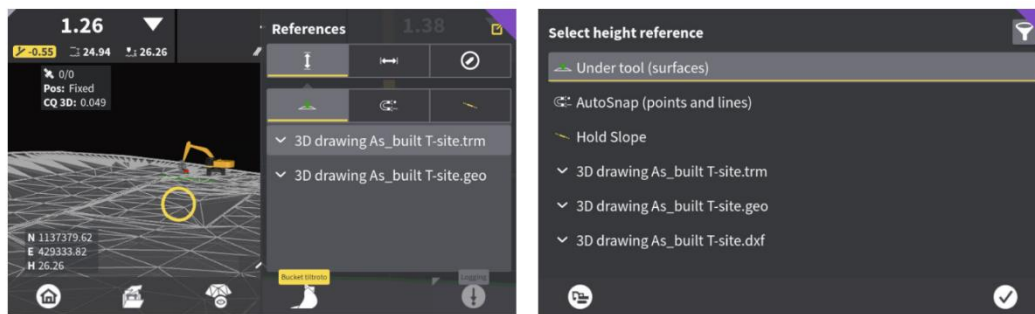


##### 3.1.2 Reference selection updates

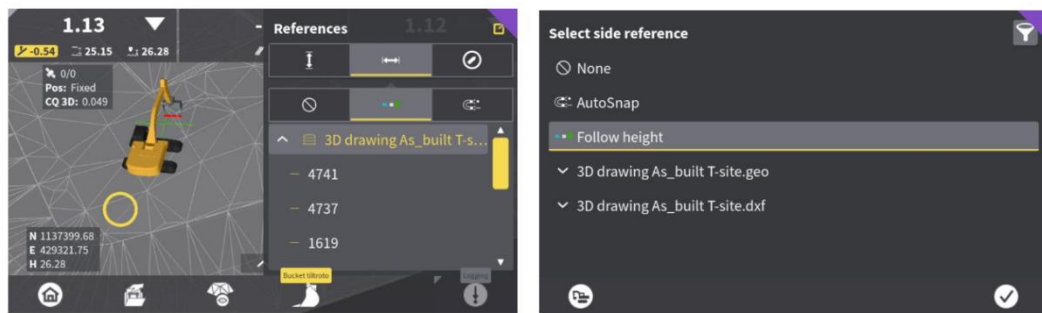
Autosnap for height feature. Points and lines. (Excavator Only)

New reference selection Icons (All Earthmoving)

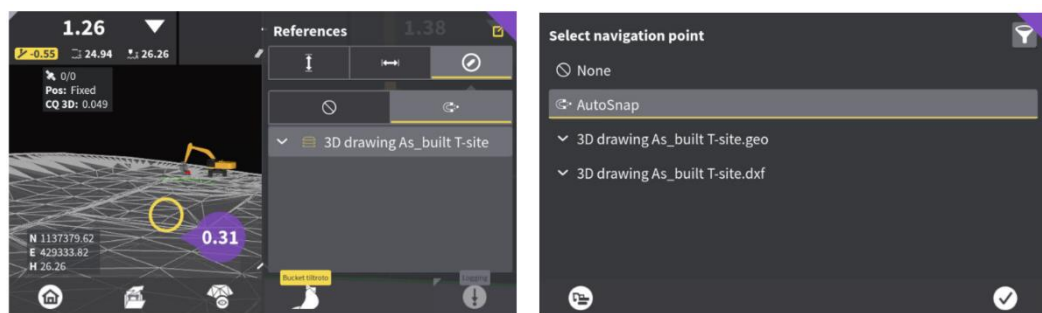
- Height reference:
  - Surfaces (Under tool point)
  - Autosnap (Points and Lines)
  - Hold slope



- Side reference:
  - None
  - Follow height reference selection
  - Autosnap (Points and Lines)



- Re-introduce Autosnap for Navigation:
  - None
  - Select navigation point
  - Autosnap to closest point



### 3.1.3 Engcon positioning solution ePS v2 and DC3 control system modules for Excavator

- Engcon ePS2 is an advanced control system, it allows for advanced control of the excavator and Tiltrotator, with absolute encoder for tilt and rotation.
- It'll be supported in MC1 from 6.6 release and in ICON Excavator in the coming release.
- Engcon ePS2 interface has been added to Co-Pilot and Semi-Auto Hydraulic interface.
- Engcon Tilt Sensor support.



**Tool Parts** 14 %

Tilt unit: None New Existing

Type: Tilt bucket Tilt rotator

Brand: Leica OEM

Name: Tilt Unit 3

Tool recognition: Enabled Disabled

Select OEM option to use Engcon Tilt sensor

MC1 version	MC1 6.6 or later
MC1 License	No change related to TiltRotator and no extra license to support Engcon Tilt sensor.
Engcon SW version	C2C firmware v2.xx or later
Supported models	EC206BS, EC209BS, EC2014S, EC219S, EC226S, EC233S. The "s" is what indicates that the units have the sensors installed. The "b" units have "s" as a factory and aftermarket option
Troubleshooting	Microconf tool provide error codes if an issue occurs e.g., "Tilt sensor has internal error".
Installation	The installation of the C2C will be described with Engcon C2C/ePS add on kit.
Tilt / Rotation sensors	Absolute encoder
Engcon license	The total price will be comparable to what ePS v1 has costed before ePS v2 intro, contact Engcon dealer for more details.

## **3.2 Dozer and Grader**

### **3.2.1 Dozer - 6 Way blade function for OnCab solution**

- IMU based sensor network for machine kinematic
- Side by side GNSS antenna support

*\*Detailed information will be sent out at a later stage*

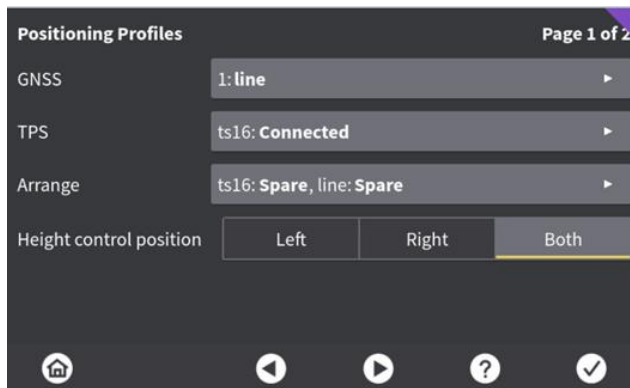
### **3.2.2 General Dozer/Grader**

- TPS/GNSS Operator input for temporary mast offset
- New interface for Komatsu D375-8 dozer
- CB14 run screen as a split view in MC1
- Grader/Dozer Blade Wear editing/saving, Operator / Installer input are synchronized
- Link Positioning Profiles with Sensor Profiles step1
- Improved heading workflow for single GNSS/TPS
- Operator input for adjustable heading behaviour
- Heading visualization in the run screen, on/off. (Dropping of crumbs/dots to visualize last twenty positions passed)

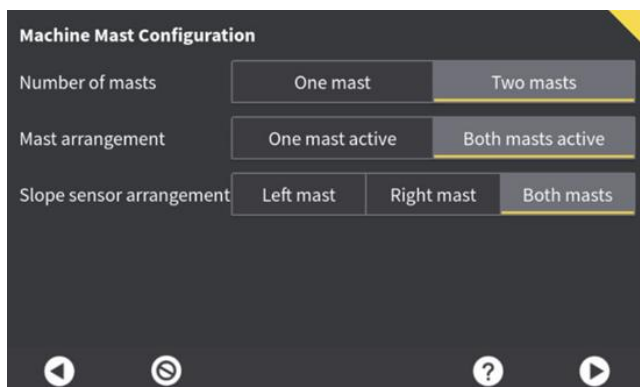
## 4. Paving Solutions

### 4.1 Mast arrangements Updates (Asphalt and Mill solutions)

- Improvements for Mast configuration when setting and arranging your position sensors.
- It is now a “2-click” process from the runscreen in the “positioning profiles”
- Useful for Asphalt and Mill solutions when multiple mast changes could be needed in daily production



- Calibration arrangement of the **Masts arrangement & Slope Sensors** is the first step of a new Mdim in one page now for ease of use.



## 4.2 *TPS Leapfrog tolerances*

TPS Leapfrog Tolerances are now Split into 2 values

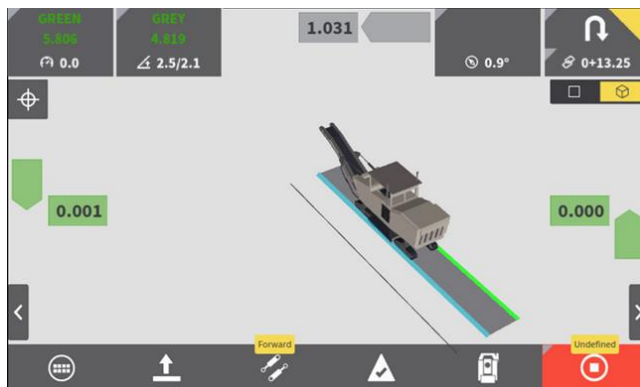
When a “leapfrog” (auto or manual) users will be notified in the run screen of the **2D Horizontal** and **Vertical** values of the TPS leapfrog.

In the leapfrog settings you can adjust the Tolerance values for the H & V distances, this is for the user cases when the site control values can differ in V + H quality depending on your project survey methods.



## 4.3 *Cold Mills-(Wirtgen Level Pro only) option to display 3D- Height + Height*

- Market request –USA for optional selection to display Height + Height deviations in Mill profiles.
- Offsets Height + Height offsets will also be active
- Easy to switch between in the display settings
- Primary control side is still user defined fixed left or right.
- Default for a new Mill profile will still be 3DHeight + Slope for most markets.



## 4.4 *Minor changes- Pave solutions.*

- Gomaco All – when creating a new profile, the default “slope sensor” will set to “Machine”
- Travel speed Locks-Min speed are default -OFF and in most cases are not needed- unless advised buy support.



## 5. Driller/Piler


It is particularly important for drillers and pilers to make a backup before upgrading the software.

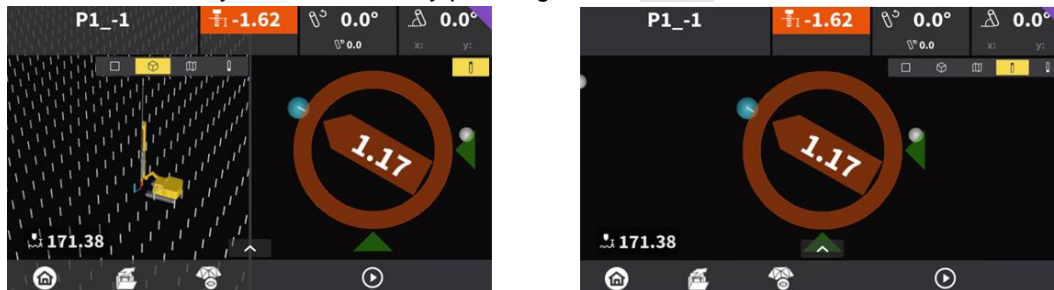
### **IMPORTANT:**

We have updated the wiring diagram to include OneSIM in all drillers and pilers, but OneSIM is not currently working for drillers and pilers that connect to the onboard system of the machines via Ethernet. These machines are the Epiroc SmartROC, Epiroc FlexiROC, Sandvik DX800i/DX900i and Liebherr pilers

### 5.1 *General improvements*

- Customizable run screen.
- There are now 2 run screens that are customizable. The split screen and the full 3D view run screen.

The bottom bullseye is accessible by pressing on the  icon



- The bullseye is now a bit more transparent, so it is easier to see the holes covered by the side distance arrow.
- The actual values of the leader angles are now displayed. These angle values are locked while drilling but they are alive while installing a pile.



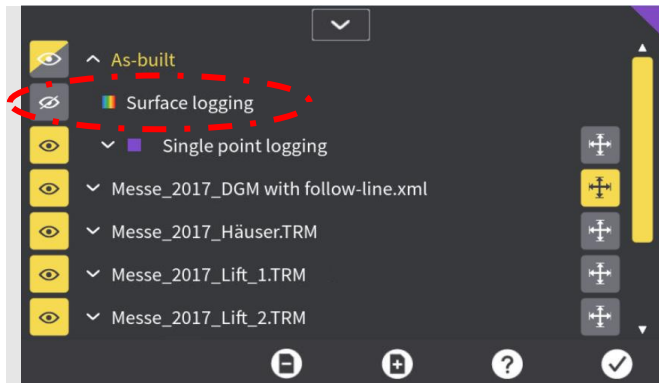
### 5.2 *Improvement of the iPiler interface*

- MC1 sends the target elevation (also called cut off elevation) the actual angle and the actual rotation of the selected pile to Junttan machine's onboard system

## 6. Alpine

### 6.1 Show/hide surface log in Command Centre (same as for earthmoving)

It has been a wish to hide the surface log (recorded snow depth data) in the runscreen while still logging data in the background. This is sometimes useful, e.g., if the operator is clearing roads in the spring and wants to clearly see the road edges without being (partly) hidden by the surface log. It is now possible to hide the surface log in the Command Centre (same as was already available for earthmoving machines):



With the surface log hidden, the operator will see the terrain/road model without the snow depth data, but still with the snow depths being shown in the top of the runscreen, and with the snow depth data still being logged in the background:



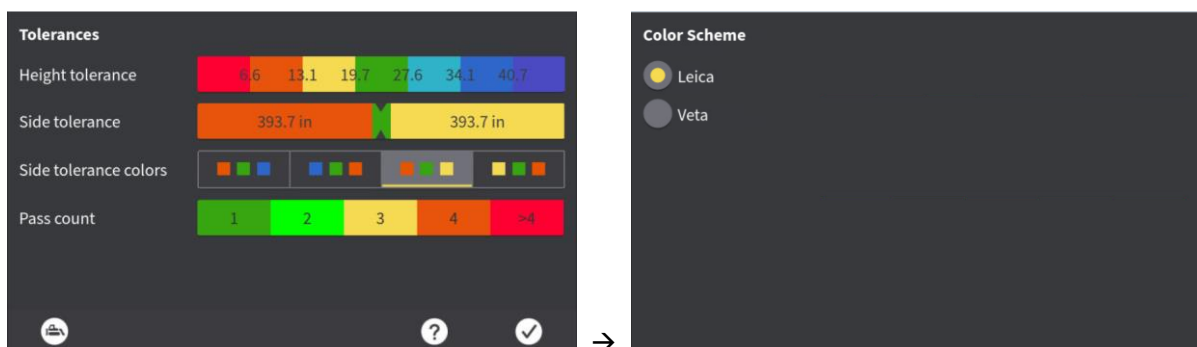
## 6.2 Pass count visible in run screen

*Pass count* can be chosen as a view mode in most of the runscreen “windows”. The functionality is already known from the MC1 Roller machine type. With this view mode, the surface log is coloured based on the number of passes (by all machines on the project) within the set time filter. The snow depth is still recorded even though *Pass count* is shown in the runscreen.

The colour scale for pass count is shown in the quick access menu number 3 (only when *pass count* is selected as view mode) and cannot be customized:

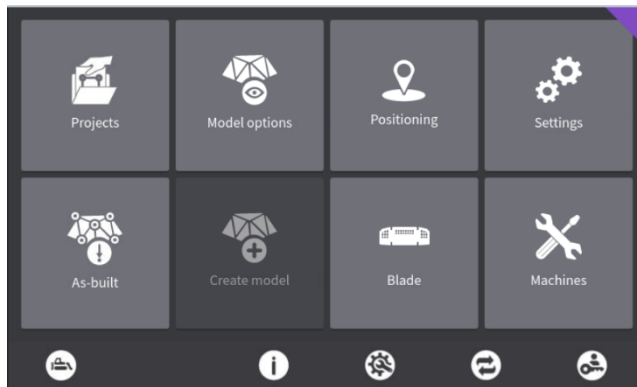
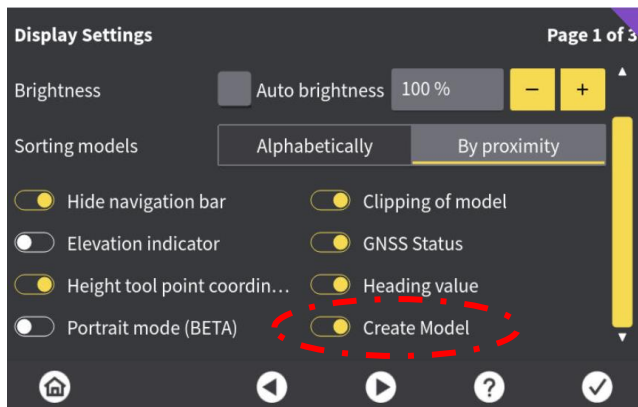


However, in the Blade / Tolerances menu the user can choose to use the normal Leica colour scale or the Veta colour scale:



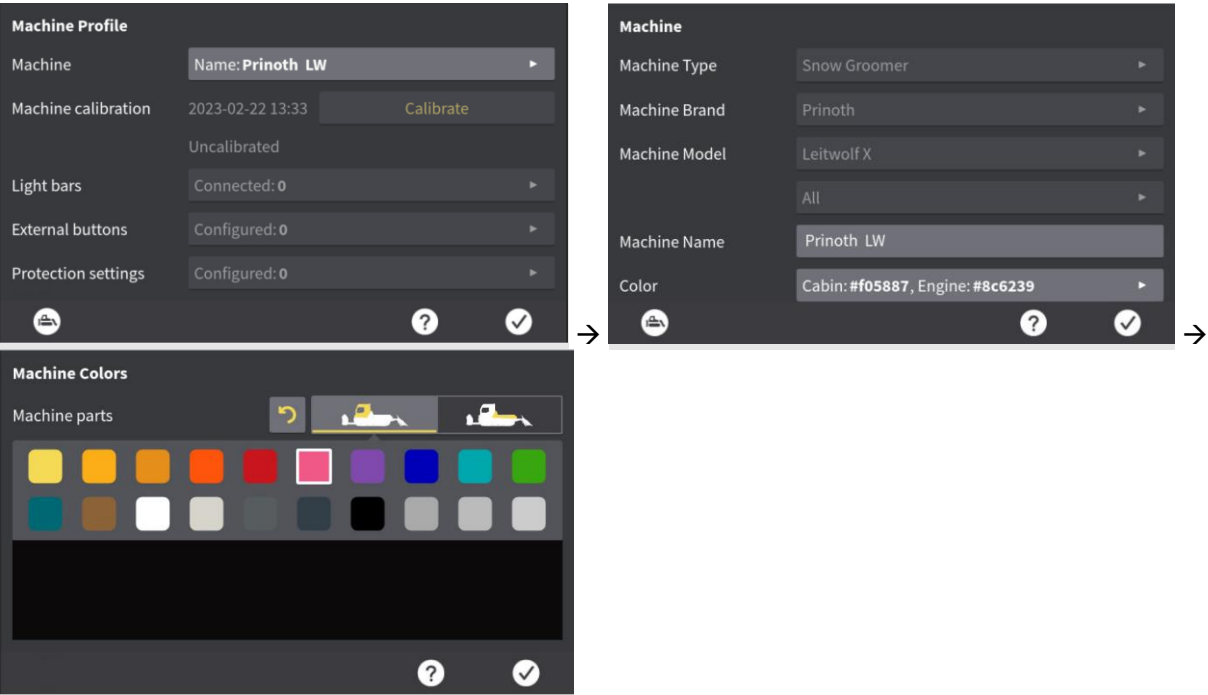
### 6.3 Home screen button for Create Model can be disabled in Settings

It was reported that some operators by mistake pressed the *Create Model* in the home screen, and ended up with an invalid terrain model, which in the end meant that no or wrong snow depth data was recorded. Therefore, it is now possible to disable the *Create Model* button in the Settings menu:



6.4 Ability to access Machine Colouring in Operator Mode

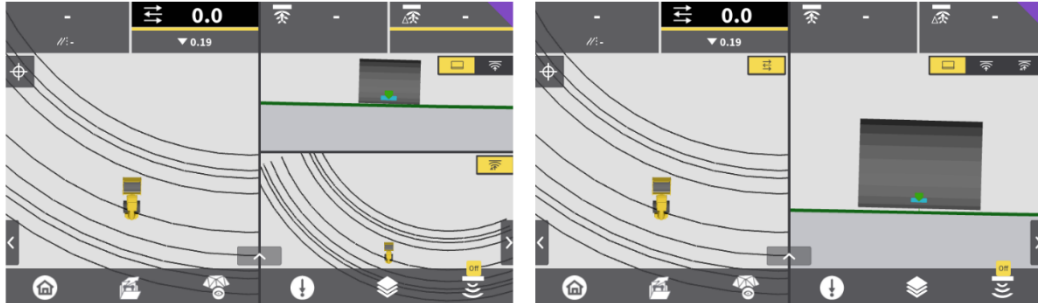
Previously the user had to be logged in as *Installer* to be able to change the machine colours for snow groomers. Now it is possible for any user, incl. operators, to change the machine colours from the Machines menu (same as was already available for excavators):



## 7. Compaction

### 7.1 *Improvements*

- Added a warning in MC1 compaction when there is no valid ISC3 license
- Own customizable runscreens view selections
- Added cross section view in the runscreens



## 8. Firmware support

MDSxx:	v2.0.6
ICG8x:	v6.8.0
ICA202:	V2.0.0
ICR80/S:	v7.5.0
ICR60:	v4.5.0
TS15:	v9.06
TS16/MS60:	v7.51
ICON Site Tablet:	v7.6.0

*\*The Machine Control App should be the latest version for Total Stations.*

## 9. Versions available on ConX

### MC1

Panel	Machine	6.4.2	6.5.01	6.6.0
	Excavator	AVAILABLE	AVAILABLE	AVAILABLE
	Dozer	AVAILABLE	AVAILABLE	AVAILABLE
	Grader	AVAILABLE	AVAILABLE	AVAILABLE
	Driller		AVAILABLE	AVAILABLE
	Piler		AVAILABLE	AVAILABLE
	Roller	AVAILABLE	AVAILABLE	AVAILABLE
	Paving	AVAILABLE	AVAILABLE	AVAILABLE
	Snow Groomer	AVAILABLE	AVAILABLE	AVAILABLE



## 10. Known Issues

Issue Type	Summary	Component/s
Bug	There are some issues with cradle fw 2.0.6 update failing on certain setups. Removal of sensors is a workaround in some cases. If the FW update freezes allow 20 minutes before restarting and then check if it has been successful. Some cases it passes on a second attempt.	MDSxx Cradle FW Upgraded
Bug	Direction Values: Trigger distance is using inches instead of feet	Dozer & Grader
Bug	Follow height for side ref not working if a point is selected for height reference	Excavator
Bug	No error message if SP15 is not connected when selecting IMU location	CB14, Dozer & Grader
Bug	MC1 screen goes red intermittently when all constellations are chosen - iCG8X issue	Positioning
Bug	Bulls eye does not change colour when within line direction tolerances	Piler
Bug	Offset value and type is not recorded in the as-built	Driller & Piler
Bug	Drilling angled holes with SmartROC results in vertical holes	Driller
Bug	When surface logging in "Auto" the logging label on F6 displays "Manual"	Surface Logging
Bug	Surface logging stops when one tool point is above or outside the trigger/modify model	Surface Logging
Bug	Setting up SmartLink via MC1 shows and uses wrong Ref frame and datum in the WebUI (See 1.1.11 for workaround)	Positioning

## 11. List of Important Bug fixes

Issue Type	Summary	Sales Force ID
Bug	MC1 Data not sent to ConX...Reference model in ConX shown wrong to chosen one on panel	SF01137590, SF01142170
Bug	Bulls eye arrow points to different direction	SF01126746
Bug	Drill pattern along line is wrong	SF01132687
Bug	Performance issues in 6.4.1	SF01019743, SF01030144
Bug	Internet through GNSS SIM not working	SF01129811, SF01138872, SF01143433, SF01144427, SF01146884
Bug	Navigation bar not completely hidden	SF01121721
Bug	ConX and MC1 inconsistency when uploading/deleting files	SF01060413
Bug	Offset issues on 6.5.x	SF01124324
Bug	External button configuration reset to default in MC1 6.5.0.1	SF01159051
Bug	The button for adding a license to iCG82 in MC1 is greyed out after 0.5 seconds in 6.5.0.1	SF01156198
Bug	Points out of the range in Hydraulic calibration	SF01178220
Bug	MC1 Dozer/Grader has lost Lipca (Communication to CB14.)	SF00761306
Bug	MC1 Dog Bone Calibration issue with strange behaviour	SF00529629, SF00529156, SF00801786, SF00831672, SF00959029
Bug	Tenstar simulator does not work with 6.5.0 and onwards	
Bug	Wrong time on the panel (Effecting ConX Sync.)	SF01054612, SF01055961, SF01158785, SF01124101, SF01163452, SF01162594, SF01160705, SF01164582, SF01165454, SF01165513, SF01166378, SF01170292, SF01170291, SF01173052, SF01168047, SF01172296, SF01172306
Bug	GNSS Simulator (Centreline) does not work in Paving	