

- when it has to be **right**



# Leica MC1 v7.0.0

## Software Release Notes

**Product:** Leica MC1

**Date:** 16/01/2024

**From:** Morten Nissen



These release notes contain essential information about:

<b>Software</b>	<b>Version</b>
Leica MC1	7.0.0
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:**

- **General rule regarding backups:**
  - It's always advisable to **back-up every time you upgrade/downgrade versions!**
  - This is a major version 7.0.0 and we **do not** support downgrade!
  - A back-up and general USB sync will **prevent the loss of as-built data and machine profile/calibration!**
  - A **manual export of surface logs** will prevent the **loss of surface log data!**
- **ConX users: Upgrade path needs to be incremental to support sync of points to/from ConX and download of other machine points needs to be active, when pre-upgrade sync is done:**
  - Syncing points only works when panel has been upgraded from a minor previous release (6.6.x) If you want to sync points from an older release (like 6.5.x) the **panel should be upgraded first to 6.6.x (and synced to ConX) before upgrade to 7.0.0!**
  - ConX users **before upgrade, need to do a manual sync** and have “Download all other machines logged points” **set to ON**. This will allow getting “own logged points” back to the panel. Due to a migration to database, for as-built data these own machine points logged in 6.6.x **will return as neighbouring points in 7.0.0.**

Download all other machines' logged points
- 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.
- MDS fw version: v2.0.16: Update will automatically take place after upgrade, restart panel if fw upgrade gets stuck for an extended period of time +20 minutes
- Version on CB14 is: v2.93
- The Leica MC1 v7.0.0 can only be loaded onto MCP80 units which have a valid CCP date of 16th January 2024 or later.

**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. Firmware support**

MDSxx:	V2.0.16
ICG8x:	V6.8.0
ICA202:	V2.0.0
ICR80/S:	V8.0.0
TS16/MS60:	V8.30
ICR60:	V4.5.0
TS15:	V9.06
ICON Site Tablet:	V8.0.0

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



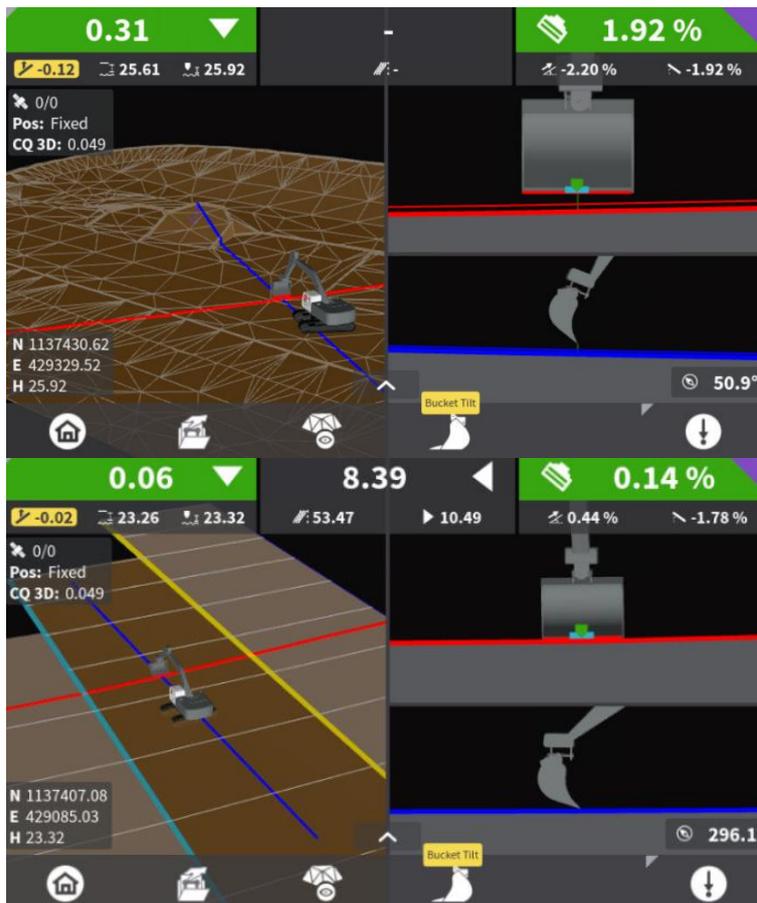
## 2. Platform new features and improvements

### 2.1 General platform improvements

#### 2.1.1 New Theme with the name: Old-Fashioned

The new Theme will bring back memories for some of you and for others it will be seen as a welcome improvement, this Theme is making the linework and surfaces more visible. So, less time is spent looking for what line or surface is used as reference. The high contrast will help operators in different light conditions.

- Higher contrast brown surface shading.
- Cross-Section **blue** lines and Long-Section **red** lines.
- CL highlighted **yellow**.



### 2.1.2 Improvement to make widgets dynamic when screen is pressed

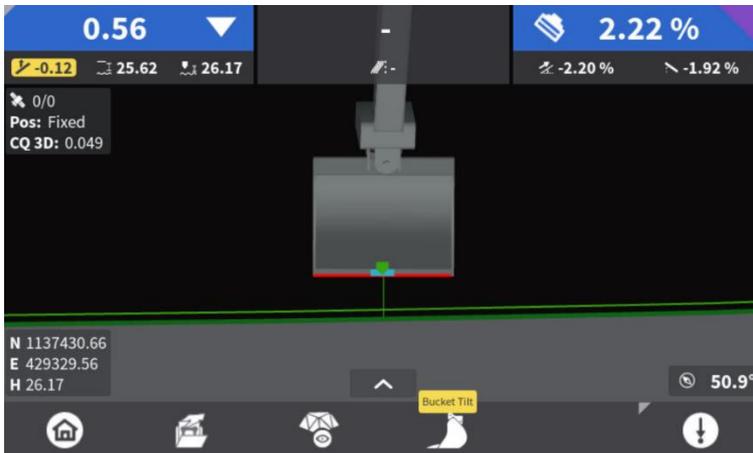
We have now made the widgets move all the way to the edges of the screen to utilize the width of the full screen, it will also disappear when touching / interacting with the screen.

- Widgets disappear when screen is touched.
- Widgets move to edges when screen is not active.



### 2.1.3 Highlight Cutting Edge in Cross Section (Red like in 3D)

We now highlight the cutting-edge red in the cross section like we do in 3D view. This makes the cutting edge stand out and easier to match with your target surface.



### 2.1.4 Remove the finalize wizard page

The finalize wizard has been removed as this was just an additional button click that brings no value. Within all wizards of MC1 you will just finish the wizard with the last actionable page. The flag is now placed bottom right, replacing the old tick mark that took you to the finalize wizard page.

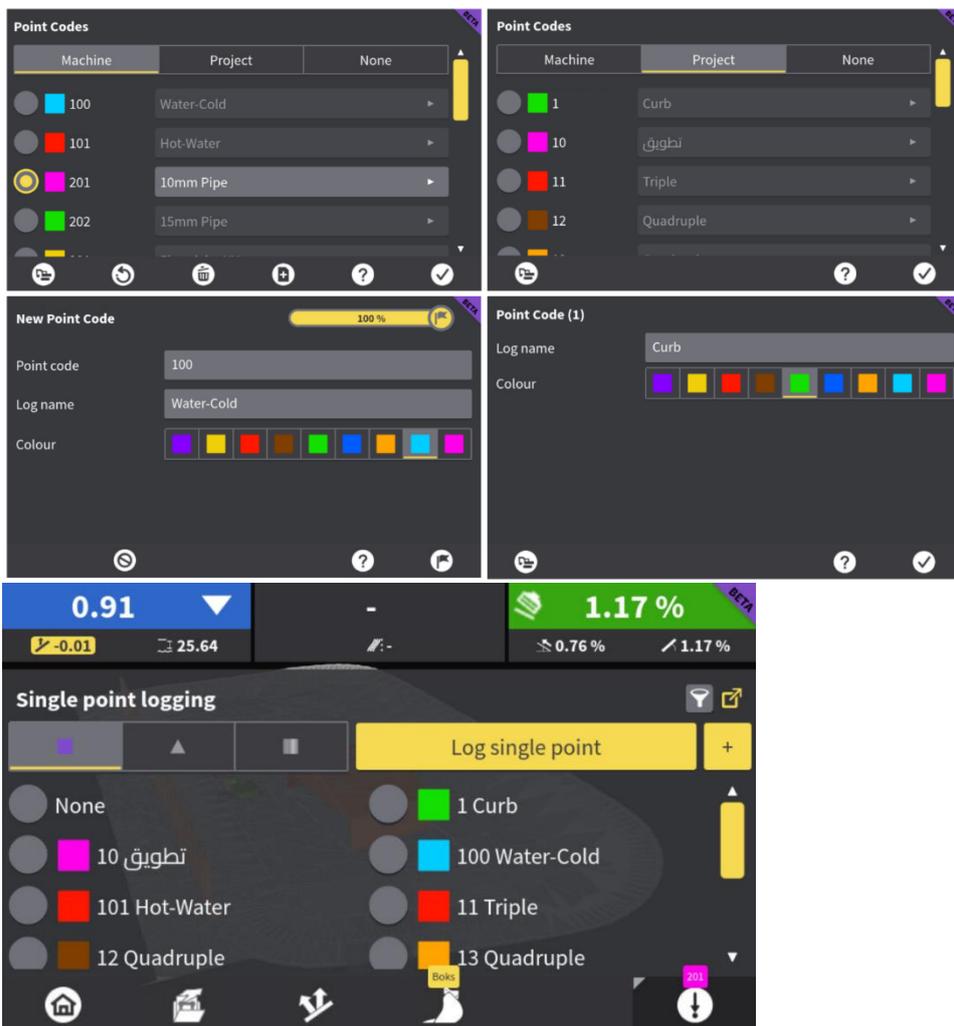


### 2.1.5 Colouring of single logged point (Point code colours)

In MC1 we now have the option to colour single logged points by assigning colours to point codes. The colouring of these points will only be local and associated with the specific machine.

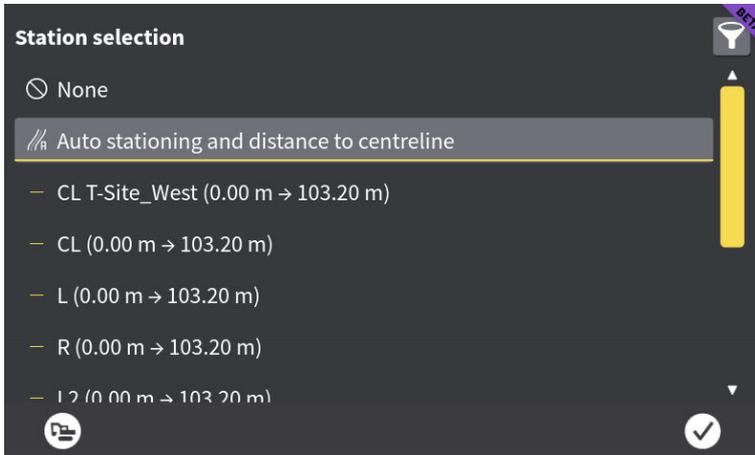
- Machine point codes (Can be newly created with a colour or current codes can be edited to have a specific colour)
- Project Points (Will originally be purple and can be edited to have an associated colour)

MC1 now has these colours of point codes in the point code list in run screen and additionally the Single Point Logging Label for point codes with corresponding colour on the F6 button, so you know what point code you have selected.



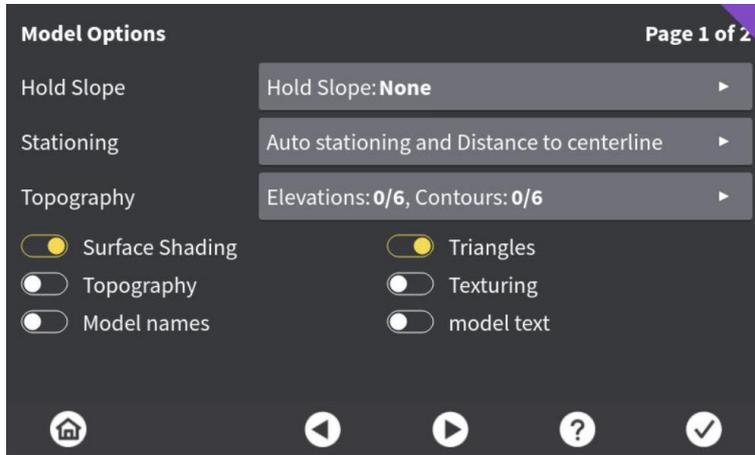
### 2.1.6 Auto select stationing and distance from centreline of "active model" under tool

In stationing selection, it is now possible to choose auto stationing and a distance to your centreline if the model contains this information. It will be displayed in the small value area alongside the stationing (highlighted in red square below) the distance to that selected centreline. *\*It's important to note you can't have this distance to centreline active and a side reference selection at the same time.*



### 2.1.7 Change buttons in whole software to Toggle Buttons

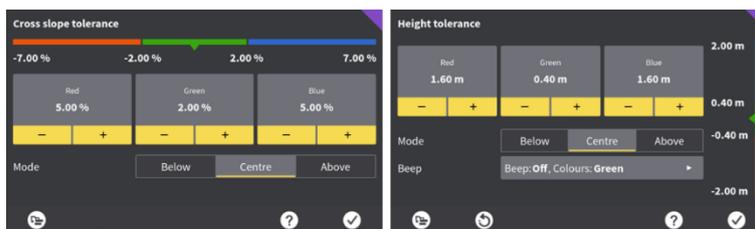
With a continued roll out of aligning the UI cross platforms. All old yellow radio buttons have been replaced with the new toggle buttons that are now used in the settings page. Allowing us to maximize space usage on these pages and to get all information on one page.



### 2.1.8 Tolerance Menu setup changes

UI changes to the tolerance page makes the usability more operator friendly and intuitive. The addition of the pen icon shows this value/tolerance is now clearly editable.

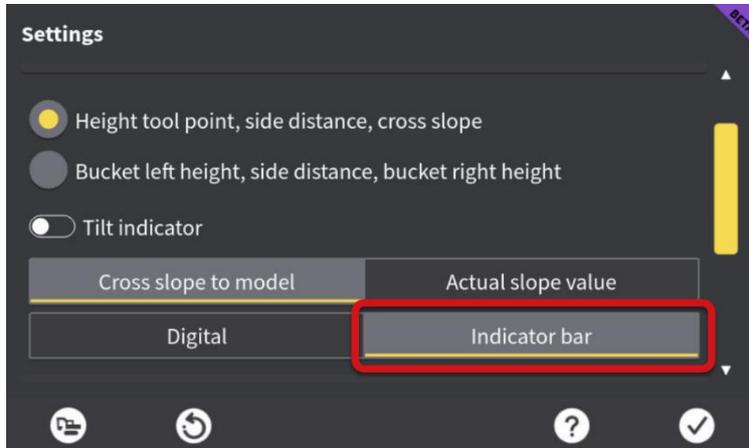
When editing cross slope tolerance and side tolerance the tolerance bar is on the x-axis and when editing is on the y-axis. This represents these tolerance as they are in the real world.



### 2.1.9 New way of displaying Tilt

It's now possible to choose between two ways of displaying the tilt value. The new indicator bar can be seen below and is a visual version of the digital value:

- Digital (current way) OR
- New Indicator Bar



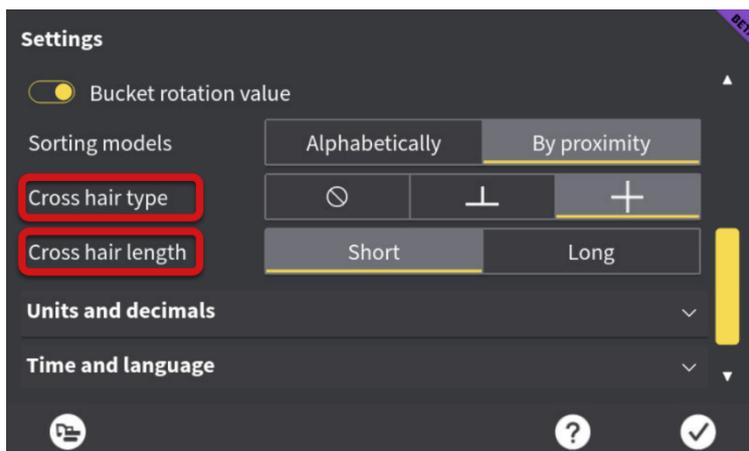
### 2.1.10 Customizable Cross hair

MC1 machines now can select between different cross hair type:

- No Cross hair
- T-Cross hair (*Projection view in the cross and long section will show what is projected on the surface by the cross hair in the 3D and 2D views*)
- 4-way Cross hair as we currently have

It's also possible to select the length of the cross hair. (If in a Multiview then the length will still be determined by the long section and cross section zoom)

- Short
- Long

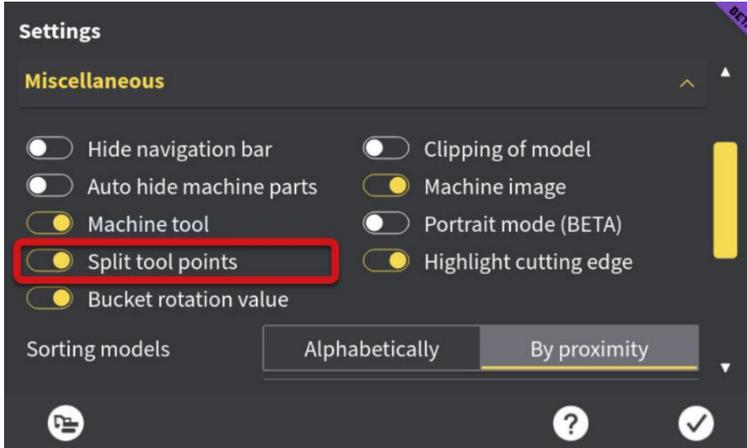


### 2.1.11 Split or Merge tool points

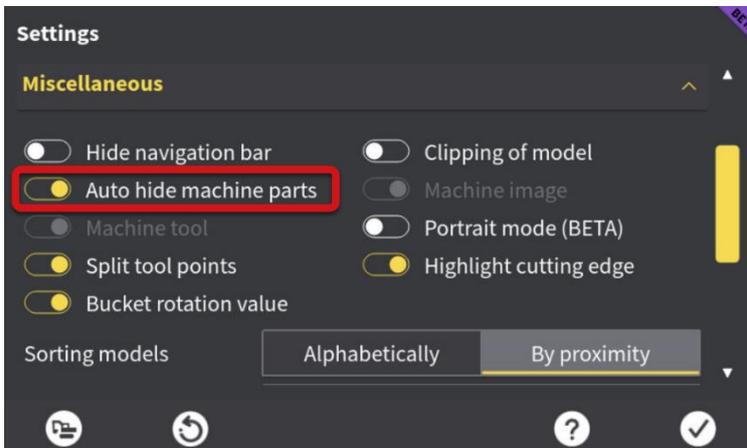
The height and side tool points can be merged now in this version. To only have a joint height tool point and side tool point. This will mean you only one tool point. If they are merged when you move either height or side, they will both move together:

Tool points can now be selected as:

- Split tool points OFF (new functionality) or
- Split tool points ON (as is today)



### 2.1.12 Hide/Show Machine and Tool based on zoom level

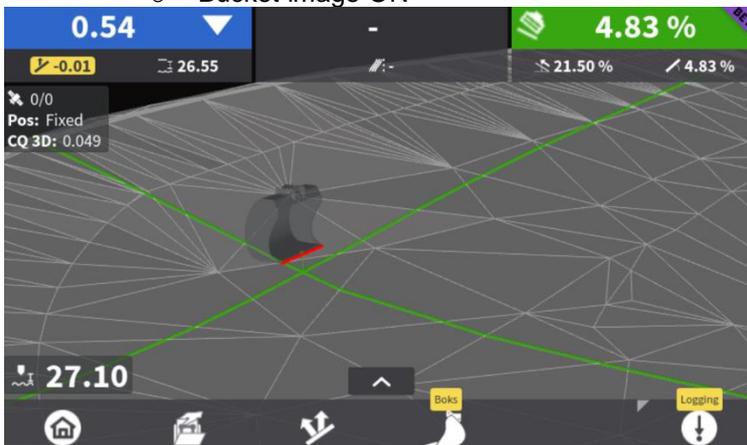


Auto hide machine parts based on the zoom level in 3D and Top view (See next page for visuals of the zoom level and corresponding machine parts visualization)

- +50% zoom:
  - Machine image ON,
  - Bucket image ON



- 50-75% zoom:
  - Machine image OFF,
  - Bucket image ON

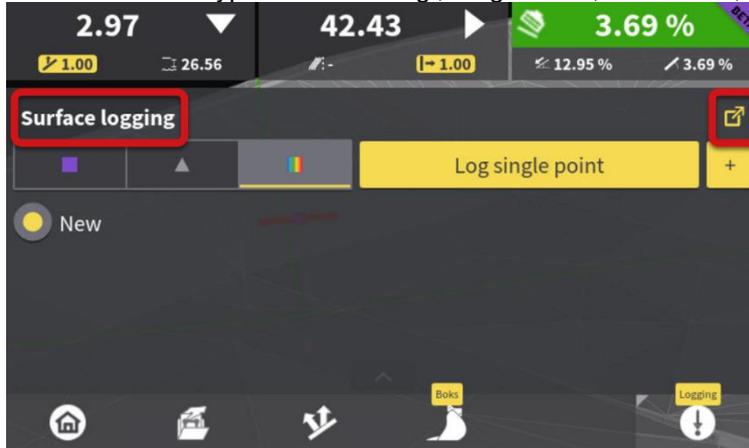


- 75-100% zoom:
  - Machine image OFF,
  - Bucket image OFF



### 2.1.13 Shortcut from as-builts menu in run screen and intuitive header

Menu now has an intuitive header that matches you current as-built type and the tab selected e.g., Single Point, Auto-Point, Surface log. Now if you utilize the shortcut key (expand) it will take you directly to the selected as-built type sub menu e.g., Single Point, Auto-Point, Surface log.



### 2.1.14 Different slope icon if its Slope to Design OR Actual Slope

New intuitive icons can be seen below in the Value Area.

- Slope to Design:

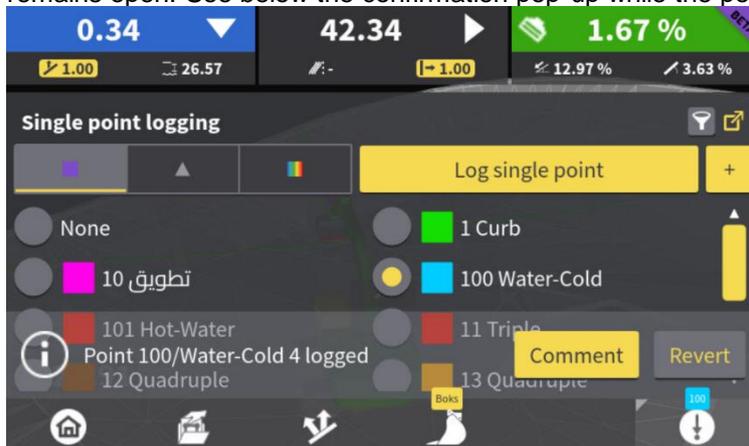


- Actual Slope:



### 2.1.15 Leave As-built menu open when log single point button is pressed

This is implemented so that the user can change between point codes while they log, and the dialog remains open. See below the confirmation pop-up while the point code menu is still up.



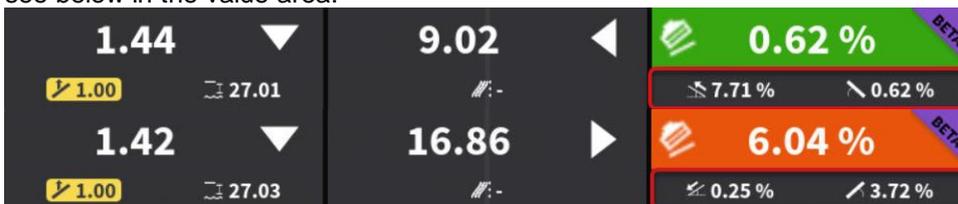
### 2.1.16 New offset icon button F3

See new offset button on the F3 key below. This icon is more suited to offset settings then the old model options icon that used to be on the F3 button.



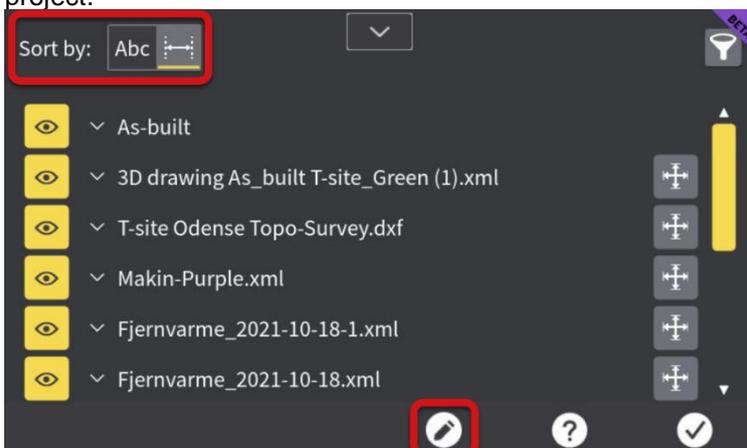
### 2.1.17 New intuitive Icons for Long and Cross Slope

The long slope and cross slope icon now change based on the direction of the slope (cross and long) see below in the value area:



### 2.1.18 Ability to sort command centre + merge delete and add into edit

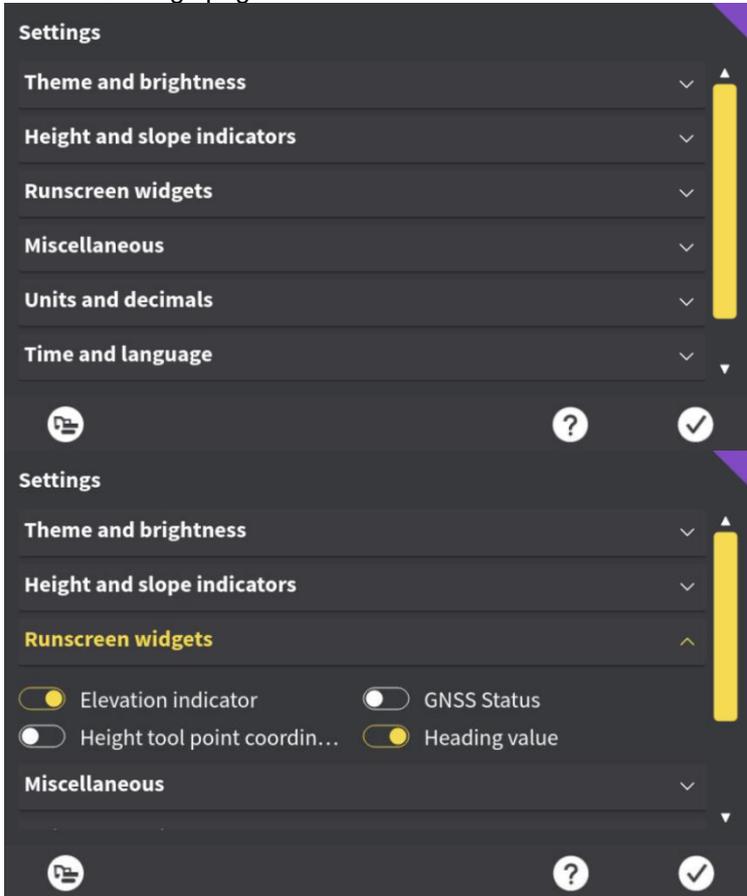
It's now possible to sort models by closets and alphabet. The command centre can also now be edited with what you would like to add or remove to the command centre. The pencil to edit can be pressed to add or remove models. This way the command centre becomes the "reservoir" of the models in your project.



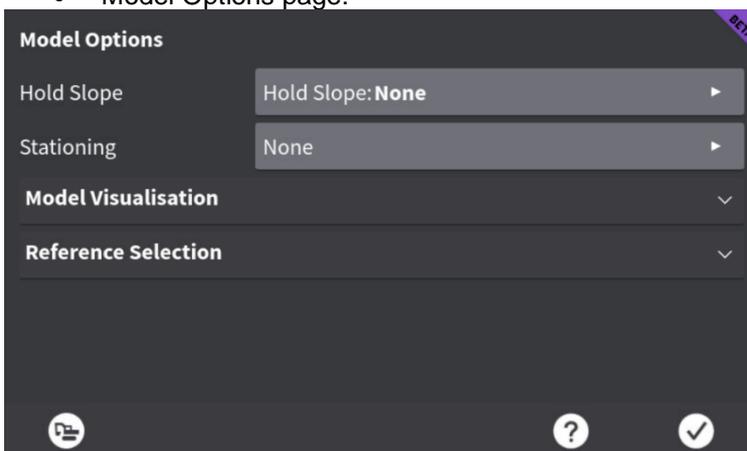
### 2.1.19 New Settings and Model Options page layout

This change has allowed us to group all info onto one page with the new dropdowns. Allowing us to remove the 1 of 3 pages etc. This is more intuitive for the user having all his setting or options in one page. No more missing information or options hidden on other pages for both Settings and Model Options.

- Settings page:



- Model Options page:



## 2.1.20 Use Ethernet to transfer GNSS fw Files from MC1 via USB (iCA202 fw2.0 or newer)

Today you have two options to update the GNSS receiver with USB

- Plug in USB in the panel
- Plug in USB in the GNSS receiver

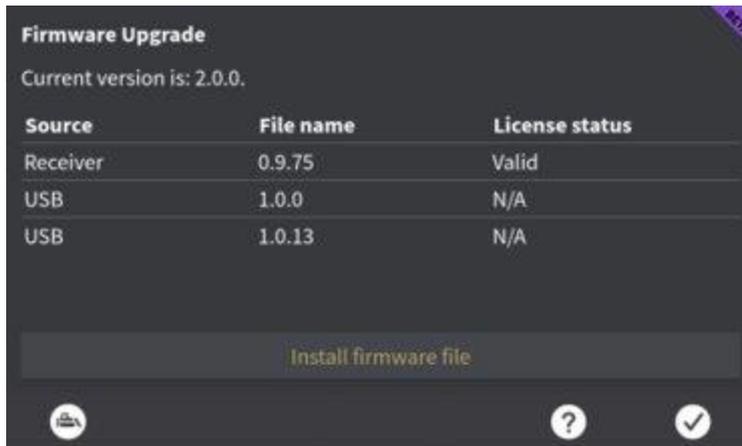
The problem is if the receiver is hidden in the machine for theft or other reasons it's cumbersome to plug in the USB-stick in the receiver. If you plug in the USB-stick in the panel today it takes approx. 2 hours to complete the upgrade due to the file transfer over CAN.

Now it is possible to:

1. Use ethernet to transfer GNSS fw files from MC1
2. Additionally enable the GNSS log file transfer from the sensor to a USB attached to MC1
3. This is only supported for iCA202 with fw version 2.0 or newer (Not supported for iCG8X)

Workflow:

- Copy the GNSS firmware file to a USB-stick in the \system-folder.
- Insert the USB-stick in the MCP80 panel.
- Use MC1 to transfer the GNSS firmware file to the GNSS receiver and start the upgrade.



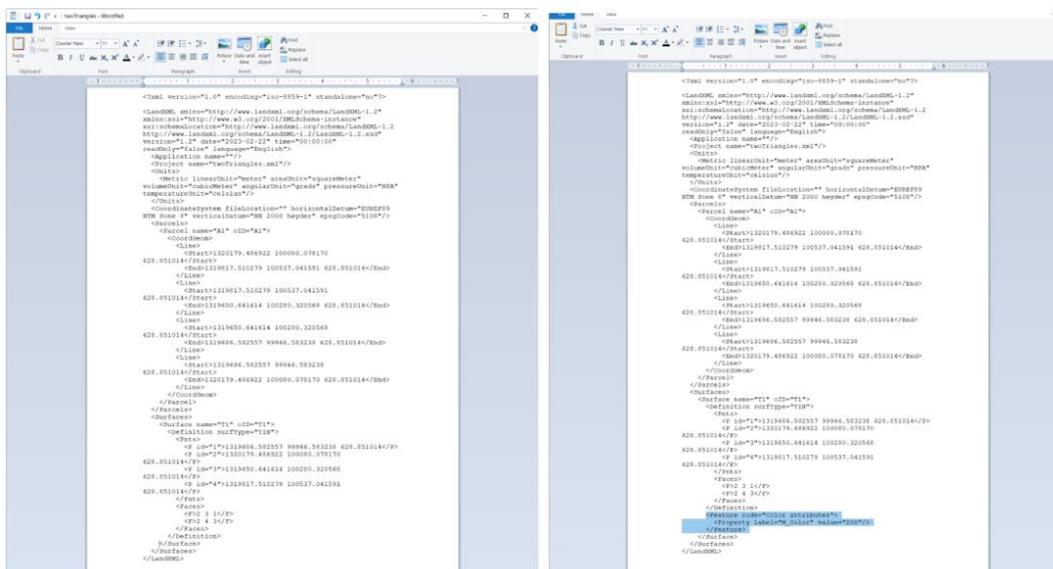
## 2.1.21 MC1 model handling/visualization improvements

- LandXML imports now “UnsymParaCurve” an unsymmetrical parabolic vertical curve elements for alignments are now supported.
- Adaptive profile sampler improves performance for cross-section calculation and supports vertical walls in cross-sections
- Several other minor fixes and improvements
- Colour support for LandXML using “M\_Color” for surfaces. See steps below to edit an existing file so MC1 can visualize the surface colours.

- Open your LandXML file in an editor. In this example, we will use WordPad on Windows. Any other editor works as well.
- To add a colour with CAD colour index 200 to the surface “T1“, we add the following lines:
- `<Feature code="Color attributes">`  
`<Property label="M_Color" value="200"/>`  
`</Feature>`

*\*Note: The text for the feature code does not matter.*

This is how the file should look like after you added the lines above. On the left is the original LandXML and on the right is the same file with the additional colour parameters added. See the added lines in blue highlight below. Make sure to save the file once you have added the additional colour parameters:



Here is an example of the edited LandXML using “M\_Color” for surfaces from above file on the right:

```

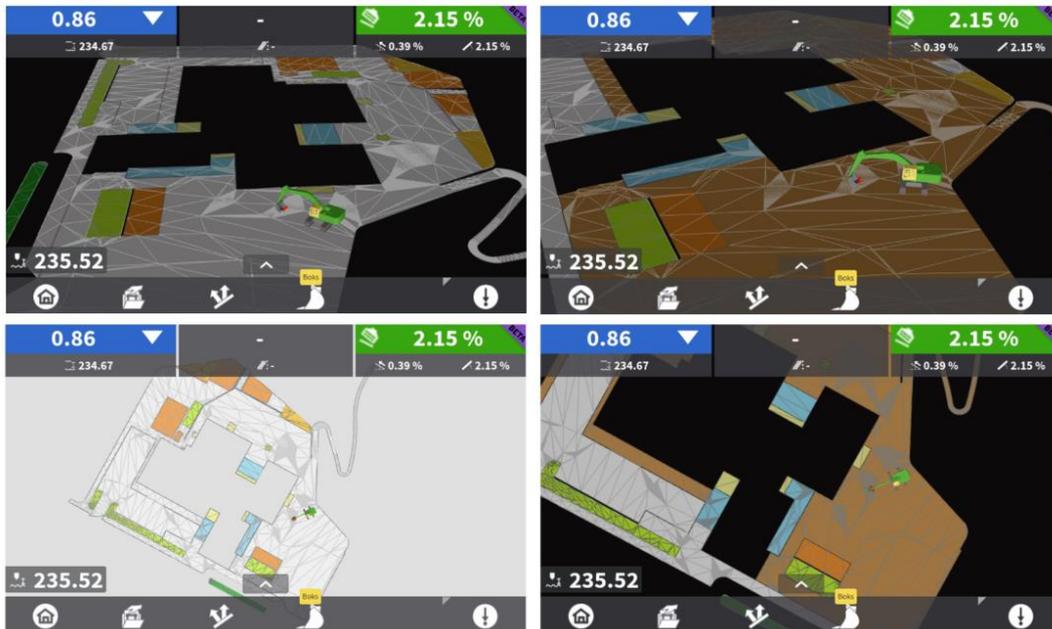
</Definition>
<Feature code="Color attributes">
  <Property label="M_Color" value="200"/>
</Feature>
</Surface>
</Surfaces>
</LandXML>

```

The index table for supported CAD colours can be found here:

Color #	Red	Green	Blue	Color #	Red	Green	Blue	Color #	Red	Green	Blue	Color #	Red	Green	Blue
1	255	0	0	86	31	127	0	171	127	127	255	56	127	127	0
2	255	255	0	87	79	127	63	172	0	0	204	57	127	127	63
3	0	255	0	88	19	76	0	193	102	102	204	58	76	76	0
4	0	255	255	89	47	76	38	174	0	0	152	59	76	76	38
5	0	0	255	90	0	255	0	175	76	76	152	60	191	255	0
6	255	0	255	91	127	255	127	176	0	0	127	61	223	255	127
7	255	255	255	92	0	204	0	177	63	63	127	62	153	204	0
8	128	128	128	93	102	204	102	178	0	0	76	63	178	204	102
9	192	192	192	94	0	152	0	179	38	38	76	64	114	152	0
10	255	0	0	95	76	152	76	180	63	0	255	65	133	152	76
11	255	127	127	96	0	127	0	181	159	127	255	66	95	127	0
12	204	0	0	97	63	127	63	182	51	0	204	67	111	127	63
13	204	102	102	98	0	76	0	183	127	102	204	68	57	76	0
14	153	0	0	99	38	76	38	184	38	0	152	69	66	76	0
15	153	76	76	100	0	255	63	185	95	76	152	70	127	255	0
16	127	0	0	101	127	255	159	186	31	0	127	71	191	255	127
17	127	63	63	102	0	204	51	187	79	63	127	72	102	204	0
18	76	0	0	103	102	204	127	188	19	0	76	73	153	204	102
19	76	38	38	104	0	152	38	189	47	38	76	74	76	152	0
20	255	63	0	105	76	152	95	190	127	0	255	75	114	152	76
21	255	159	127	106	0	127	31	191	191	127	255	76	63	127	0
22	204	51	0	107	63	127	79	192	102	0	204	77	95	127	63
23	204	127	102	108	0	76	19	193	153	102	204	78	38	76	0
24	153	38	0	109	38	76	47	194	76	0	152	79	57	76	38
25	153	95	76	110	0	255	127	195	114	76	152	80	63	255	0
26	127	31	0	111	127	255	191	196	63	0	127	81	159	255	127
27	127	79	63	112	0	204	102	197	95	63	127	82	51	204	0
28	76	19	0	113	102	204	153	198	38	0	76	83	127	204	102
29	76	47	38	114	0	152	76	199	57	38	76	84	38	152	0
30	255	127	0	115	76	152	114	200	191	0	255	85	95	152	76
31	255	191	127	116	0	127	63	201	223	127	255	86	127	191	127
32	204	102	0	117	63	127	95	202	153	0	204	87	95	127	63
33	204	153	102	118	0	76	38	203	178	102	204	88	38	76	0
34	153	76	0	119	38	76	57	204	114	0	152	89	76	76	38
35	153	114	76	120	0	255	191	205	133	76	152	90	63	255	0
36	127	63	0	121	127	255	223	206	95	0	127	91	159	255	127
37	127	95	63	122	0	204	153	207	111	63	127	92	95	127	63
38	76	38	0	123	102	204	178	208	57	0	76	93	127	204	102
39	76	57	38	124	0	152	114	209	66	38	76	94	38	152	0
40	255	191	0	125	76	152	133	210	255	0	255	95	191	255	0
41	255	223	127	126	0	127	95	211	255	127	255	96	127	223	127
42	204	153	0	127	63	127	111	212	204	0	204	97	153	204	0
43	204	178	102	128	0	76	57	213	204	102	204	98	57	76	102
44	153	114	0	129	38	76	66	214	152	0	152	99	114	0	152
45	153	133	76	130	0	255	255	215	152	76	152	100	63	255	0
46	127	95	0	131	127	255	255	216	127	0	127	101	95	127	0
47	127	111	63	132	0	204	204	217	127	63	127	102	63	127	63
48	76	57	0	133	102	204	204	218	76	0	76	103	57	102	204
49	76	66	38	134	0	152	152	219	76	38	76	104	38	152	0
50	255	255	0	135	76	152	152	220	255	0	255	105	255	255	0
51	255	255	127	136	0	127	127	221	255	127	223	106	255	255	127
52	204	204	0	137	63	127	127	222	204	0	153	107	204	204	0
53	204	204	102	138	0	76	76	223	204	102	178	108	204	204	102
54	153	152	0	139	38	76	76	224	152	0	114	109	152	0	114
55	152	152	76	140	0	191	255	225	152	76	133	110	152	76	133

See examples of these LandXML using “M\_Color” for surfaces in MC1:



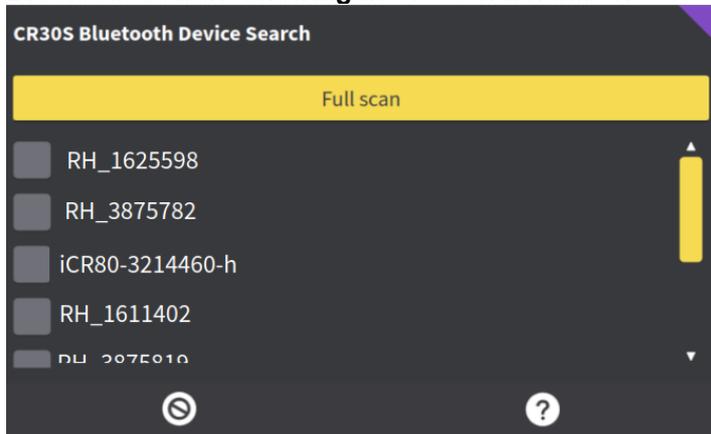
### 2.1.22 CR30s –MC1 support for up to 6 total stations

Number of total stations that can be connected and arranged when using Leica MC1 with Leica CR30s Long range Bluetooth has been extended to 6.

- While 6xTPS support is tailored for MC1 paving solutions, its available for all solutions: Dozer, Grader, Excavator etc...
- MC1 Runscreen and TPS connection UI been updated to accommodate the support of 6 TPS while the functionality principle has remained unchanged.
- For best performance when using TPS and MC1 v6.7 its strongly recommended to run the latest released f/W versions on the TS. Make sure the MCap is also updated to the current version as well. MyWorld for more information.

TPS Models	Firmware version; Nov23	LRRH Radio Handle	MCR900-m (restricted regions)	Feature support
iCR80/s	8.00v	CCD6/ RH18	Yes	Full support
TS16/60	8.30v	RH17/ RH18	Yes	Full support
TS15	9.06v	RH16/ RH17	Yes	Limited for some functions
iCR60	4.5v	CCD2/ CCD6	Yes	Limited for some functions

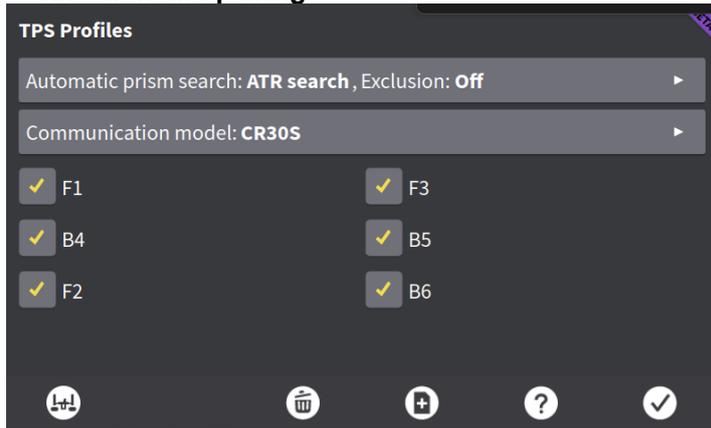
#### Bluetooth search -showing the TS serial number.



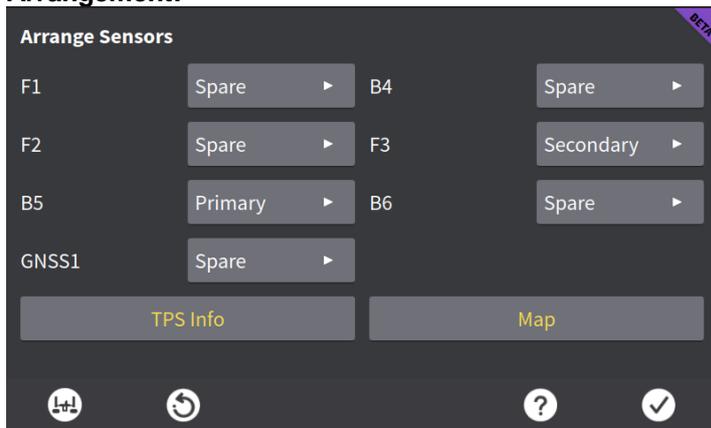
#### TPS naming – Customizable



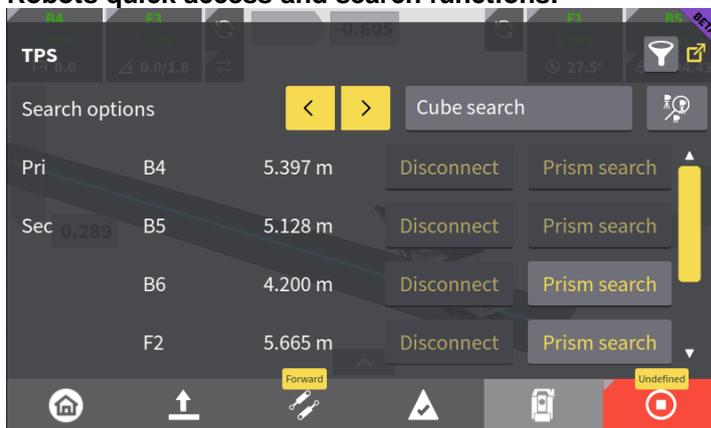
## Connection and pairing



## Arrangement:



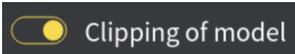
## Robots quick access and search functions:



\*More about leapfrog functionality and Paving Runscreen in section 4.1.

### 3. Surface Logging – Modify Models for earthmoving

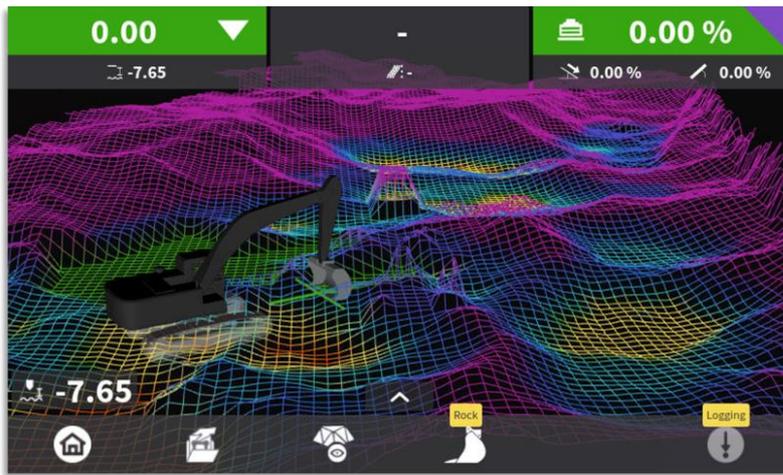
**\*Note:** Make sure model clipping is ON (Miscellaneous Settings) for best performance when utilizing the surface log feature.



#### 3.1.1 The surface logging trigger is now displayed in the 3d and top view run-screens

The trigger is modified as surface logging progresses. The trigger is only represented on the run-screen and is not included when syncing surface log data

- The trigger displayed in the screen shot below is a model created from a surface scan



### 4. As-Built Improvements

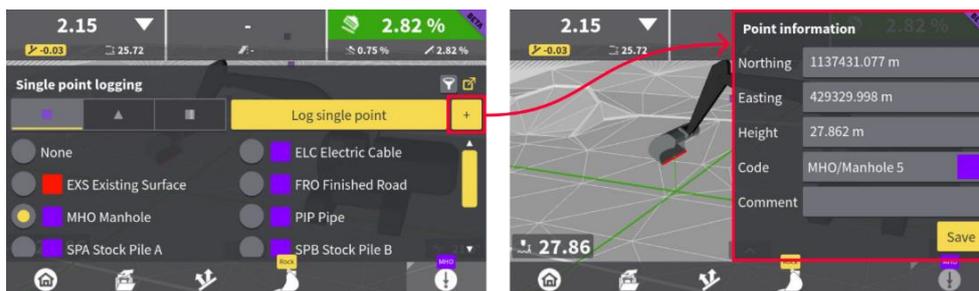
#### 4.1.1 Create a single as built point by manually entering coordinates.

A new “Add” button, located in the pop-up screen of the push, and hold of the logging button (F6), A press of the “Add” button will open a panel to enter the following information.

- Nothing
- Easting
- Height
- Point code (optional)
- Point comment (optional)

Note:

- The N.E.H values shown when the create point panel opens are the current tool point position, all values can be edited.
- Once the values have been entered the point will be created when the “Save” button it pressed.
- The point can be edited or deleted like any other point created on “my” panel



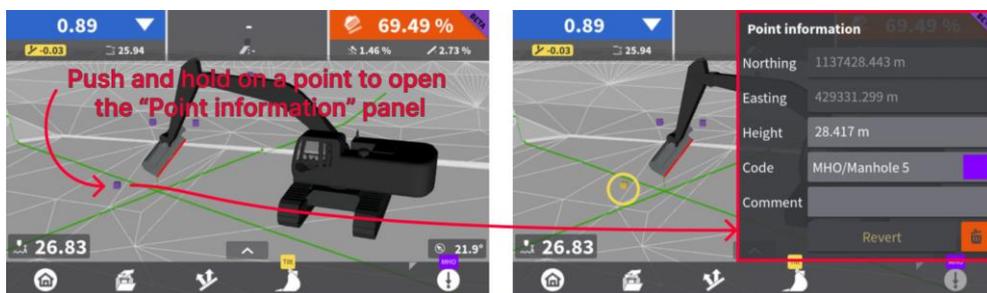
#### 4.1.2 Edit, Add Comment and Delete single as-built points

Push and hold on a point in the run-screen to open the points information page, here the operator can.

- Apply and offset to the points height
  - If the height has been edited by adding an offset, the offset value is visible beside the point height in bracket ( )
  - The point will be displayed in the new position on the run-screen
- A point code can be added or changed
- A comment can be added or changed for the point
- The point can be deleted
  - A revert option is available before the page is closed to restore the deleted point

\*Note: Northing and easting values **cannot** be edited.

\*Note: Single points must be selected as referenceable in the command centre to allow the push and hold functionality for point information, point editing and delete.



## 5. Earthmoving

### 5.1 Excavator

#### 5.1.1 General Improvements

- New wheeled Excavator Model
- Possibility to turn ON/OFF Bucket, Tilt, and Rotation sensors in calibration wizard



## **5.2 Dozer and Grader**

### **5.2.1 General Improvements**

#### **5.2.1.1 Blade wear visualization dozer and grader**

We now can visualize the blade wear for dozer and grader. In the past there used to be a gap between the blade and the cutting edge.

#### **5.2.1.2 Remote lightbar display behaviour, blinking flash can now be turned on/off**

Now possible to turn off the lightbar blinking. This was an issue for regions that have minimal daylight or night works as it's a major distraction in the cabin.

#### **5.2.1.3 Centre the cutting edge in Cross-Section View for Dozer + Grader**

In the cross-section view the cutting edge is now set by default to the centre of the view.

#### **5.2.1.4 Japanese language for CB14**

Additional language support in CB14. Japanese is now supported.

#### **5.2.1.5 Link sensor profile with positioning profile improvements**

There have been more improvements with sensor profiles and positioning profiles to better link these. This is a continuation of the work done in 6.6.x.

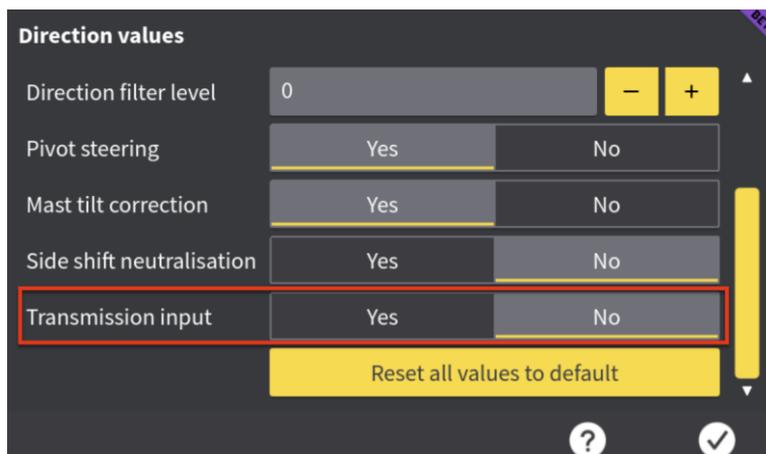
### 5.2.1.6 New updated Dozer and Grader models

It can be seen below we now have two different models for dozer, 6-way blade and push blade. The grader model has also been updated to have more detail.



### 5.2.2 Gear status use for machine direction

A long-awaited request for dozers and graders is to be able to utilize the machine gear signal from CAN interface for establishing heading, this is now a new feature in MC1. It is possible to turn this ON/OFF. Default for this setting is OFF.



### 5.3 Wheel Loader + Skid-steer & Compact Tracked Loader

#### 5.3.1 Introduction of three new machine types to the MC1 Platform

- Wheel Loader (WL)
- Skid-Steer Loader (SSL)
- Compact Tracked Loader (CTL)



This release is another step in the phase out of iCON 3D SW, where we currently have support for Wheel Loaders.

The Leica iCON grade iGW3 WL, SSL & CTL systems will be a one-to-one offering of what we support in iCON 3D but now in MC1 with all the MC1 Platforms benefits.

Everything we have become familiar with on the MC1 Platform is now part of your Loader Solutions. This now makes it a one-for-all 3D application.

- Ease of use with a new look UI/UX experience
- Manage your as-built data with the all-new Surface Logging
- Protect Machines and Personal with PA80 Awareness
- Share data seamlessly with ConX
- Customizable Runscreen views and Runscreen widgets
- Improved Create Model functionality
- Light Bars and External Button configuration

### 5.3.2 Out of Scope and FAQs

- CTL/SSL only Radial Lift supported but not Vertical Lift. (Vertical Lift will still work in the “grade” window +-200mm)
- No on cab or articulated sensing. Receivers need to be mounted front frame for Wheel Loader. But CTL and Skid-Steer on cab is supported.
- No automatic hydraulic control.
- Only support for buckets no other attachments. (Tilt Unit and multiple bucket creation supported)
- No TPS calibration option in iCON Site for SSL and CTL but measurements are the same so WL option so that import is one-to-one and can be used.
- 2D not supported only 3D dual GNSS. (No TPS support)
- Is X-JB16 required? No, the power will be connected to CAN1, and the sensors will be connected to CAN2 after using the CAN switch feature in MC1.

### 5.3.3 UI of Wheel Loader + Skid-steer & Compact Tracked Loader



## 6. Paving Solutions

### 6.1.1 General improvements & Bug fixes

- Reported CAN timing on machine interfaces and in some case can interrupt the connection to a machine. This was due to an issue on the Can3 port of the MDS and is fixed in the latest updated of the MDS Firmware **v2.0.16**
- Slipform- when creating a new profile, the default is now set on for using both primary & secondary mast slope sensors.
- Auto merge- Cancel mid- function. This has now been improved so if a cancelation is necessary before a complete run of the distance the remaining AM offsets are also reset.

### 6.1.2 6 TPS support for paving machines

Performing leapfrog has become easier with this new functionality and ensures that you can work uninterrupted for longer periods.

New buttons have been made available for easier management of the total stations: **Toggle** and **Swap** These two new buttons are replacing the old functionality of `tapping` on a Spare.

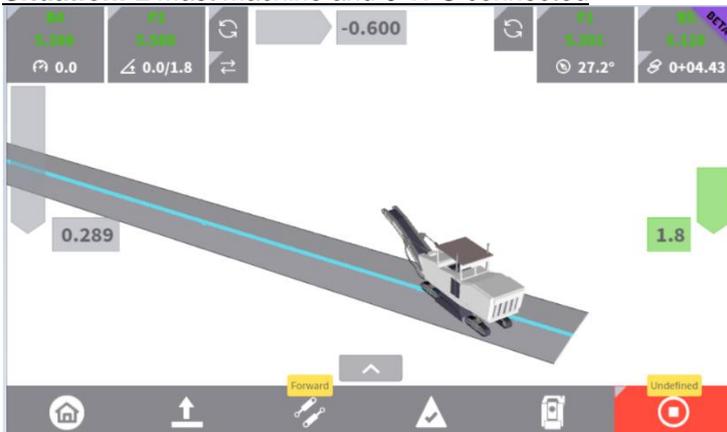


**Toggle** button allows the user to navigate through the spare instruments and decide which Spare will be in an `active` state and which will remain in an `standby` state.



**Swap button** will allow the reassignment of the spares to a specific mast directly from the Runscreen

**Situation:** 2 Mast machine and 6 TPS connected

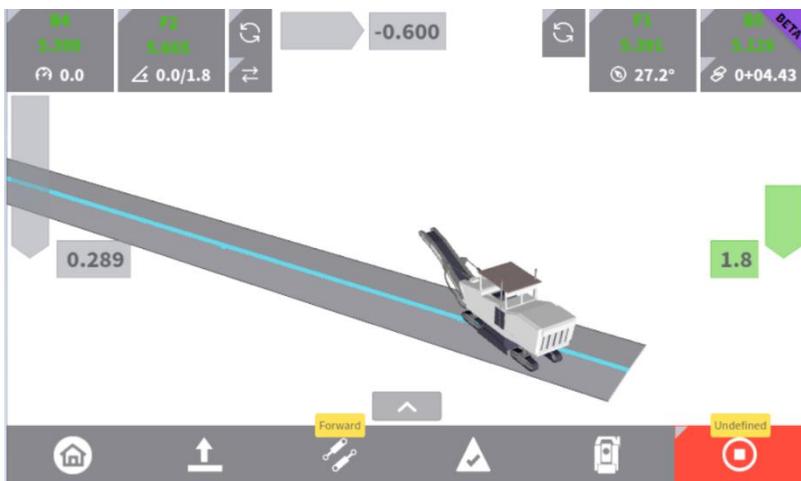


- B4 Primary
- B5 Secondary
- F3 active spare for Primary
- F1 active spare for Secondary
- F2 standby spare for Primary
- F3 standby spare for Secondary

➤ Toggle on Primary mast Spares



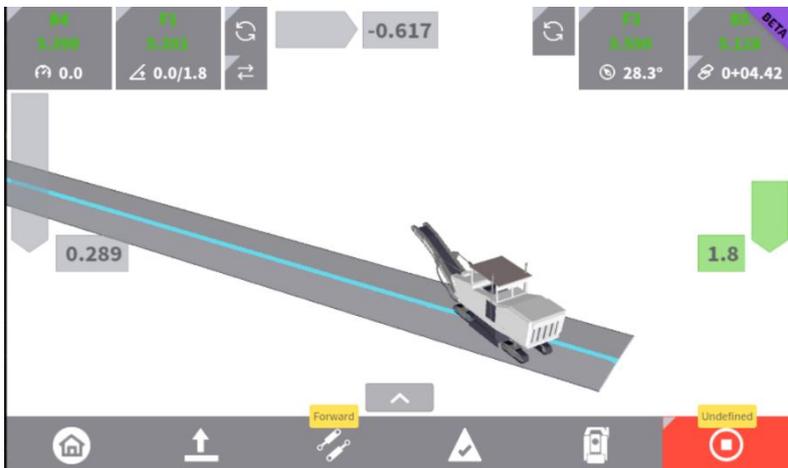
By using the Toggle button, the Spares F3 and F2 will change their position and F2 will become the Active spare for the Primary Mast



➤ Swap Spares



By using the Toggle button, the Spares F3 and F1 will be reassigned; F1 will become active spare for Primary mast and F3 active spare for the Secondary mast.



## Leapfrogging



Manual leap with a **TAP&HOLD** on the Active / Primary/ Secondary mast.

**Auto-leapfrog** has not changed, functionality remains the same; Only difference is that now a mast has more Spares to choose from, when performing a leap.

**Tap&Hold on Spare** has the same effect as before; will force a turn-to-mast (Smart Spare behaviour)

### 6.1.3 OEM support

#### 6.1.3.1 Vögele OEM New –5 machines support

The new machine series S1900-5 and S2100-5 will be supported by iCON pave with their Navitronic and Niveltronic 3D protocols.

Existing interface cable and licenses to be used with the new machines.

#### 6.1.3.2 Shantui OEM –asphalt paver support

The new Leica MC1 7.0.0 brings the support of Shantui OEM for Leica iCON pave solution.

- New 3D interface MC1 for Shantui Asphalt pavers (SPS90-Gi2, SPE125-Gi2)
- Supported 3D Height+Steer+Edge control
  - License: 989558 MSW2155 OEM Interface Shantui Road paver
  - Interface cable: **Existing** 923351 MYC MDS CAN1&3 to MJB1305, 3.0m

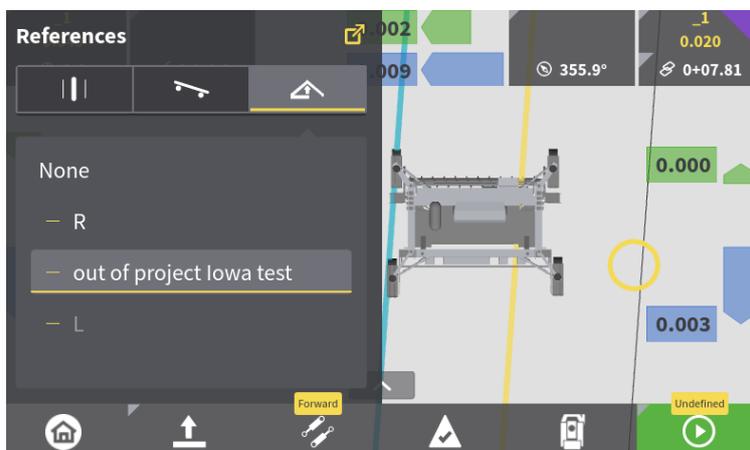
*For further information please contact Product Management*

### 6.1.3.3 Power Curber OEM

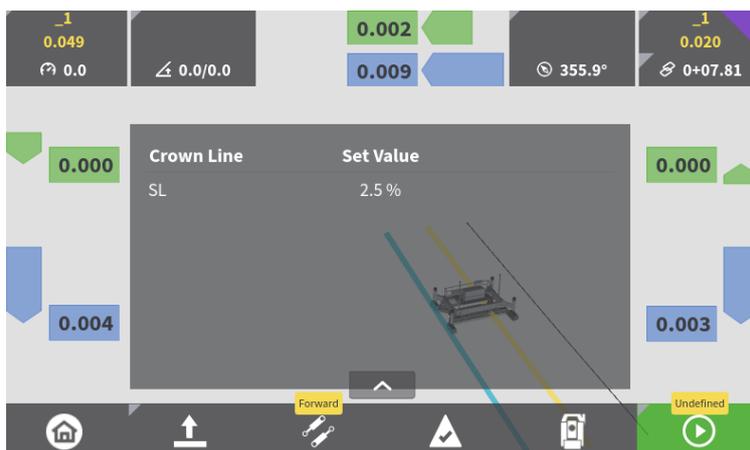
- Support of the new **PC3400** machine with its PowerCurberCAN protocol. Existing interface cable and licenses to be used with the new machines.
- **Crown control** - Leica iCON concrete with its Leica MC1 7.0.0 release is bringing a new feature on the market-**CROWN CONTROL** for Power Curbers-Slipform pavers

Crown control offers the possibility to select a crown line and to calculate the slope between the Reference and the **Crown line**.

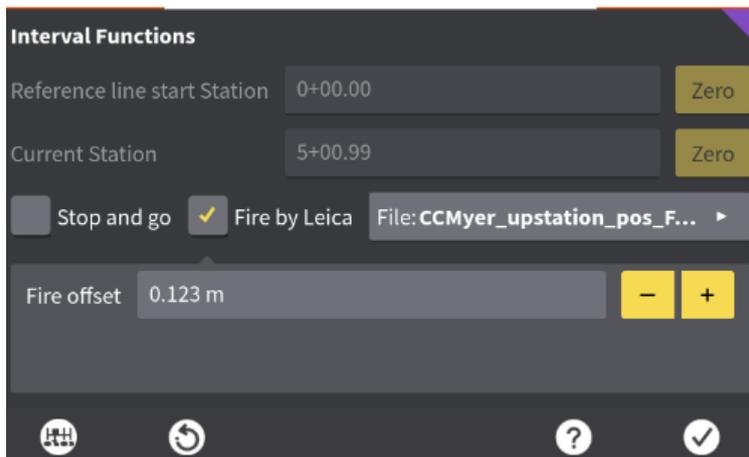
- **NO additional license** needed for Crown control.
- Line selected as a Crown line is immediately reflected in the Runscreen in yellow colour.



- Crown slope is dynamically calculated and displayed in the special Crown line Runscreen (5<sup>th</sup> Ruscreen)



- **Fire by Leica** functionality opened for all PowerCurberCan powered Slipform pavers and Curb and Gutters.
  - License: existing 869215 MSW2114, Fire by Leica
  - Fire by Leica for DBI (Dowel bar inserter) and CTBI (Side bar inserter) is made available for Power Curber 5700D, 7700 and New 3400



## 7. Driller/Piler

### Important information before upgrading to 7.0.0

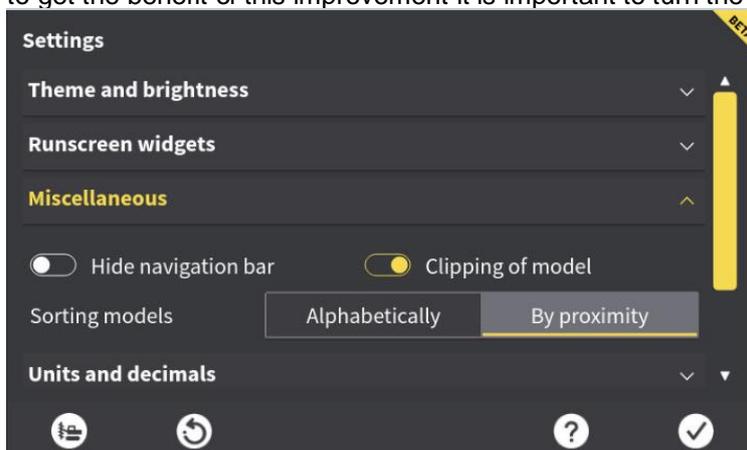
It is important to follow these steps when the panel is upgraded to 7.0.0 from a version older than 6.6.0

1. Manually synchronise to ConX
2. Upgrade the panel to 6.6.0 if the panel runs an older version
3. Upgrade to 7.0.0 release candidate
4. If the logged points are not visualised, synchronise to ConX again
5. Make sure clipping is On and Download all other machines 'logged points is enabled in the Connectivity > ConX setup page
6. In case the connectivity to the 3<sup>rd</sup> party system is lost, please power the machine completely off and turn it on again. We have seen this issue on Epiroc SmartROC and Epiroc FlexiROC machines.

### 7.1 Driller improvements

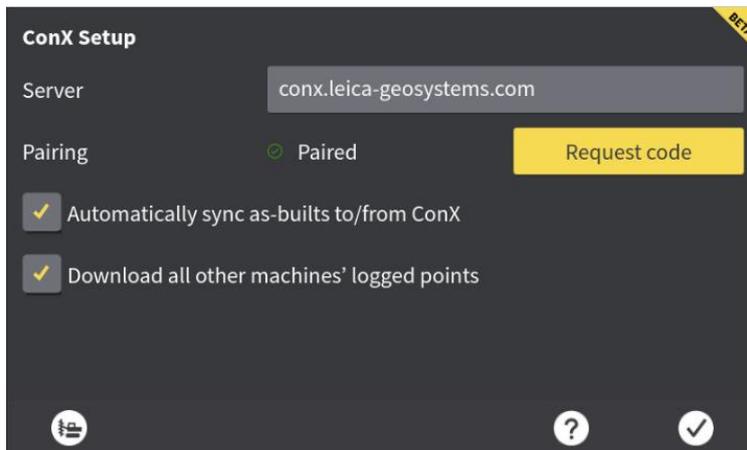
#### 7.1.1 Performance improvement

There were some performance improvements made when there are many points in a reference file and to get the benefit of this improvement it is important to turn the Clipping On.



### 7.1.2 Shared project changes

For being able to see the holes/piles logged by the other machines on the same project, the “Download all other machines 'logged points” must be enabled.



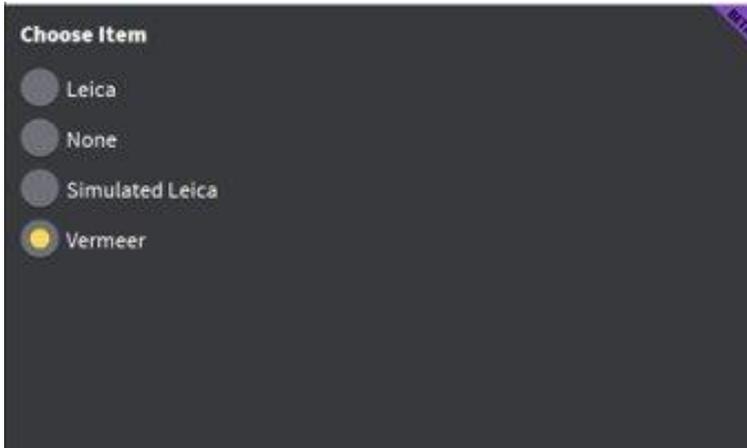
### 7.1.3 Epiroc machine related bugs are now fixed

The associated known issues for Epiroc machines are now repaired. List can be found in important bug fixes table.

## 7.2 Piler improvements

### 7.2.1 Possible to connect MC1 to the PD10 and PD5 Vermeer pile drivers.

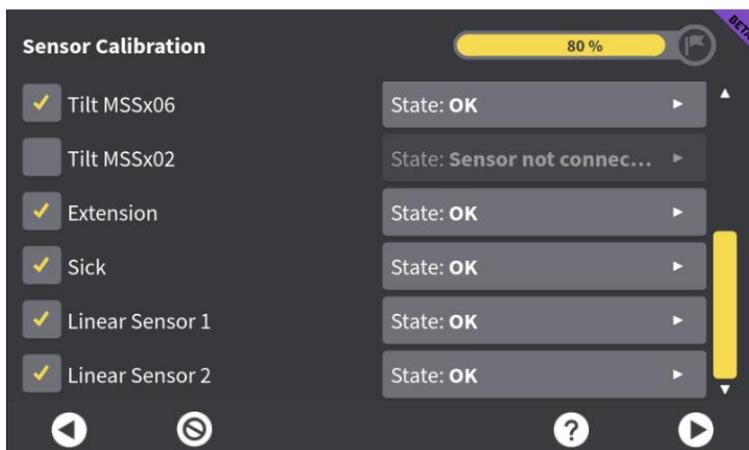
The machine sends MC1 the start signal, MC1 calculate the depth and sends a stop signal to the machine.



The IM 998618 piler (Vermeer, PD10) manual describes how to connect to the 3<sup>rd</sup> party system.

### 7.2.2 New Laser and Linear sensors are released to measure depth on pile drivers (all generic pilers)

- A laser (Sick) sensor measures the travel of the hammer on a pile driver
- Magnetic encoder (Linear sensor 1 & Linear sensor 2) measures the vertical travel of the leaders/leader.



- A manual is released to explain the installation and the calibration of these two sensors

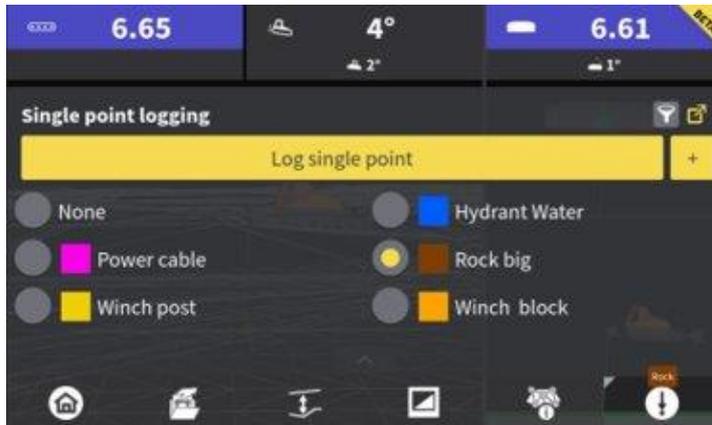
**There is an issue using the laser and the magnetic sensor in MC1, version 7.0.0 but it works in the previous versions (6.6.2, 6.6.0, 6.5.0)**

## 8. Alpine

### 8.1 General improvements

#### 8.1.1 Updated Log Centre (F6)

The “Log Centre,” accessed with the F6-button, is now aligned with the earthmoving machines, but has been adapted for snow groomers to only contain the *as-built single point logging*:



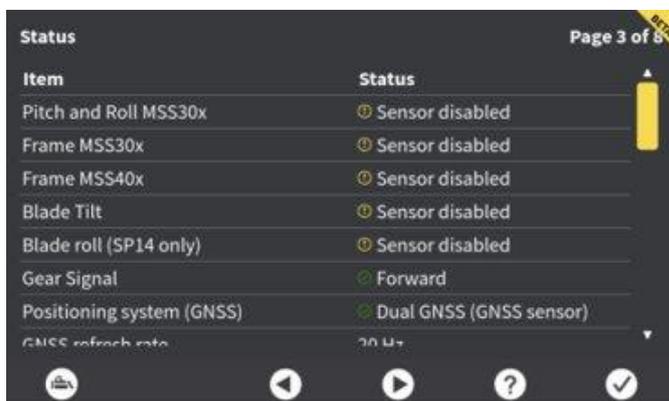
#### 8.1.2 SP15 Blade Sensor support for Alpine

The *SP15 Dual Slope blade sensor* is now supported for snow groomers. It is configured and used exactly as the existing SP14 blade sensor.

#### 8.1.3 Gear signal usage for Prinoth

It is now possible to utilize the gear signal from Prinoth snow groomers to get a more precise determination of the forwards/backwards movement of the machine. This is specifically implemented for the use case, when **Dual GNSS Lock is set to OFF**, and the system is falling back to single GNSS mode (GNSS1 or 2 antenna covered). The setting can be found in the Direction Values menu in the Machine calibration, and the default value is ON.

Connection to the Prinoth CAN-bus is made through the CAN1 or CAN2 connector on the MDSxx docking station – depending on whether the machine is a pre-installed Leica-ready machine or not (see also section 8.4). On a Leica-ready machine, the cable for connection to the Prinoth CAN-bus is installed from factory. The status of the Prinoth gear signal connection can be seen in the Maintenance / Status screen.

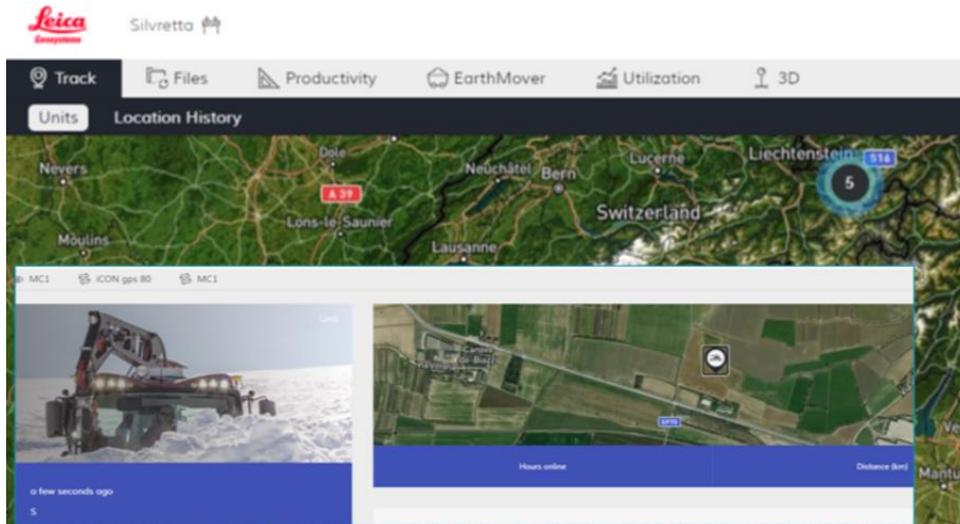


## 8.2 MC1/ConX-related bug fixes important for snow groomers

### 8.2.1 MC1 machine status shown on ConX is now correct.

Previously some machines would be displayed with wrong status on ConX:

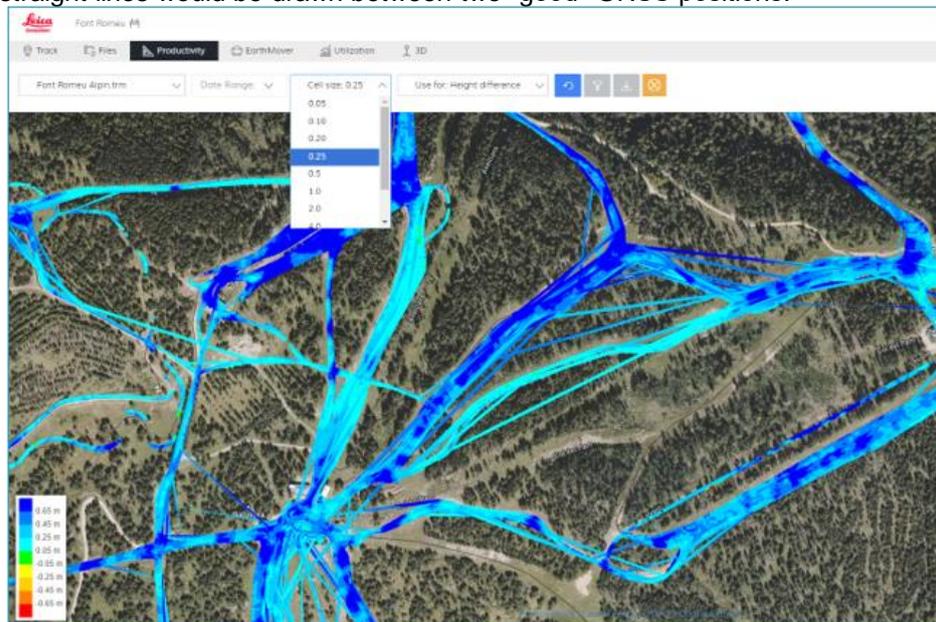
- Wrong position (far away from the site, or even in the middle of the ocean)
- Wrong reference model status (up to date / older / newer version)
- Wrong time for “Last online”



Example of a wrongly located snow groomer in the middle of a field in Italy.

### 8.2.2 Surface log will not draw straight lines in bad GNSS conditions.

Previously, when the machine would experience a certain combination of “bad” GNSS reception, long straight lines would be drawn between two “good” GNSS positions:



Example from a ski resort which was particularly affected by the problem with drawing straight lines.

This problem is now solved. Small gaps in the surface log will still be connected to ensure a consistent look of the log.

### 8.2.3 Machines to not consume huge amounts of SIM-card data anymore.

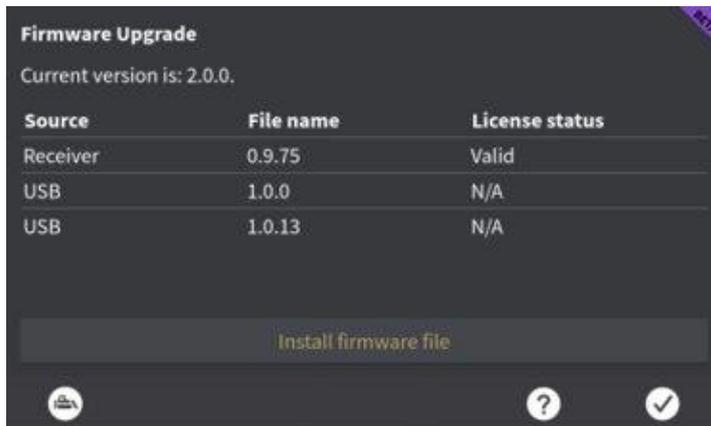
Previously, a few reports from various machine types around the world were received, where the MC1 system would consume massive amounts of SIM-card data – up to 50 GB per month or even more. A problem with the connectivity of MC1 has been found and fixed.

## 8.3 GNSS-related improvements/fixes important for snow groomers

### 8.3.1 Ethernet transfer of GNSS firmware files from MC1

It is now possible to transfer GNSS firmware files from MC1 to the GNSS receiver (iCG8x and iCA202), if the GNSS receiver and the docking station are connected with an ethernet cable (1-SIM solution).

- Copy the GNSS firmware file to a USB-stick in the \system-folder.
- Insert the USB-stick in the MCP80 panel.
- Use MC1 to transfer the GNSS firmware file to the GNSS receiver and start the upgrade.

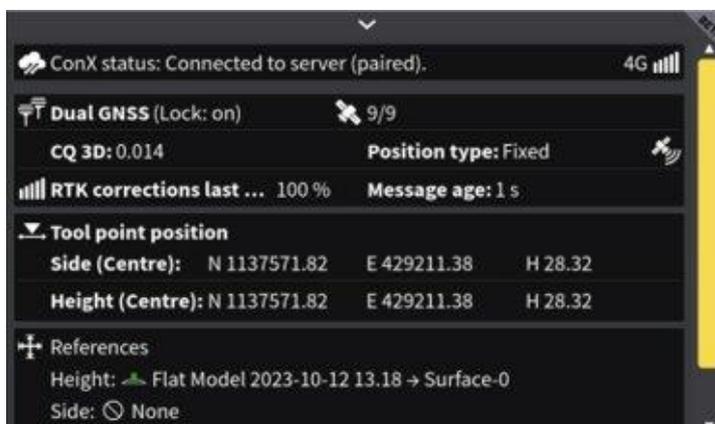


### 8.3.2 Ethernet transfer of GNSS log files to USB in the panel

Same as above, if the GNSS receiver and the docking station are connected with an ethernet cable, then it is possible to use MC1 export and transfer GNSS log files from the GNSS-receiver to a USB-stick inserted in the MCP80 panel. This function is found in the Maintenance menu.

### 8.3.3 1-SIM GNSS modem info in the Icon Info Bar

Previously, when having a 1-SIM solution with the SIM-card in the GNSS receiver being used for internet connection for MC1, the *Network Type* and *Signal Strength* was not shown in the Icon Info Bar accessible from the run screen. This has now been improved to show those two values also for 1-SIM:

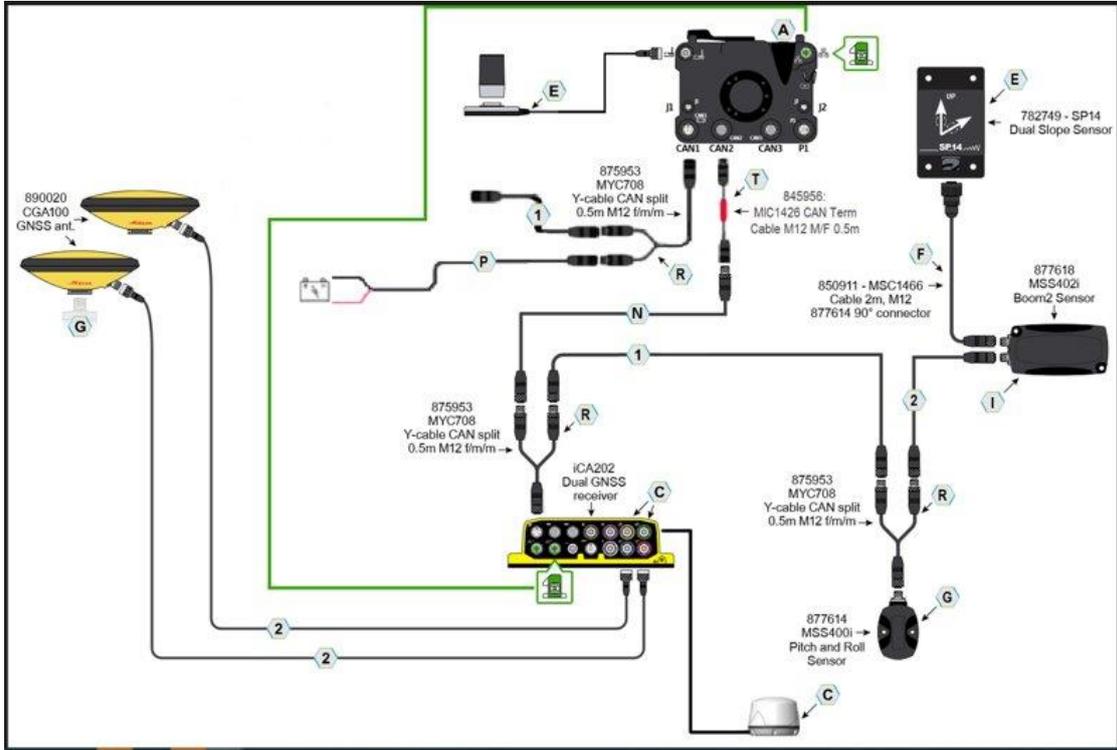


### 8.3.4 Fix for issue when the left GNSS antenna on iCA202 was losing signal.

Previously, when the left GNSS antenna (GNSS1) on the iCA202 lost signal, then the GNSS refresh rate dropped to 0 Hz, causing a warning in the MC1 runscreen. This issue is now fixed.

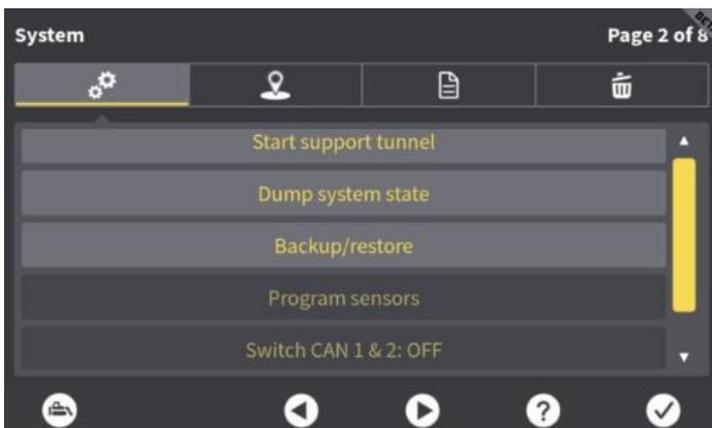
### 8.4 Prinoth Leica-ready machines now using CAN-switch.

Prinoth snow groomers, which are factory-installed as *Leica-ready* has, starting from 2023, been wired slightly differently than the normal aftermarket wiring and without an XJB-16 junction box:



Wiring diagram of a Prinoth Leica-ready machine

When installing such a machine, it is important to use the CAN1-2 switch in MC1, otherwise MC1 will show that there is no contact to the GNSS receiver or the angle sensors:



## 9. Compaction

### 9.1 General Improvements

- 3D, Cross and Long Section views for Roller
- Point Codes selectable from run screen now and this is more in line with a one for all solution
- Reverse button is moved to F3 for this change
- Pass count without decimal ON/OFF



## 10. Known Issues

Issue Type	Summary	Component/s
Bug	Machine not able to work on given TRM model. Very specific to certain TRM's. Dozer blade jumps all over the place when auto is engaged.	Dozer
Bug	As-built points scale in 3D view when zooming in top view with roller only. Zooming in pass counts when triple screen view. These scales the points in CMV and Delta CMV.	Compaction
Bug	Switching to point code with roller actively logging surface, stops surface logging until surface tab is selected again. F6 press & hold menu. This will be aligned with Snow Groomer in next release to fix potential issue.	Compaction
Bug	Network interface set to manual upon creating new Driller machine.	Driller
Bug	OEM Tilt Rotator. Tilt sensor always disabled when entering the wizard to create a new Tilt Rotator for the first time.	Excavator Tilt Rotator
Bug	Deleting a model data type "avoidance zone" from ConX project should delete from panel, but currently it does not. Model must be deleted off ConX and deleted/unselected of panel to remove it or turn it off.	Avoidance Zones
Bug	When using manual Ethernet settings then oneSIM is not working.	oneSIM
Bug	Auto hide machine parts based on zoom level does not work directly after restart. A zoom re-activates it.	Run screen
Bug	Cannot read gear signal from CAT 120 next gen grader. CAN reverse implementation.	Grader
Bug	No position while triggering export logs to USB on iCA202. After completion position is good again but a restart is recommended.	GNSS
Bug	No pop-up confirmation when you save a custom created point through (+) in F6 menu.	Custom Single Point Log
Bug	Long slope is not shown across the whole view when using "None" cross hair or "T-shaped" cross hair. Work around is to use default "Full" cross hair.	Cross Hair
Bug	Auto points size logged on previous version when zooming in and out are not scaling (upgrade issue from previous releases) cleaning of single/auto log point data base will solve the issue. Auto log points on current version will scale correctly.	Auto Point Logging
Bug	MUS1400 not working properly after MC1 version 6.5	Dozer + Grader

Bug	When opening TPS or GNSS sensor profile on Dozer / Grader the profile gets registered as 2D mode profile. A restart solves the issue and creates the Positioning Profiles correctly. This will only be seen when the first Positioning Profile is created and will only be seen by installers. Upgrade of exiting profiles won't see this issue.	Dozer + Grader
Bug	Long section view surface logging with height trigger is not showing all the blue trigger surface. Excavator works correctly.	Dozer + Grader, Wheel Loader, CTL
Bug	When enabling SwingBoom and start the SwingBoom calibration. Sometimes there is the warning message:   PositalProtocol.cpp: 44   WARNING   Message queue overflow - protocol can't keep up! Work around is to clean the panel and re-start the calibration process.	Excavator Swingboom



## 11. List of Important Bug fixes

Issue Type	Summary	Sales Force ID
Bug	Offset type and offset values are missing from As-built file for RIG.	SF01167653
Bug	Value on create slope model grade, rounds up to 1 decimal.	SF01173621
Bug	CQ 3D tolerance cannot be entered by keyboard.	SF01245331
Bug	Predefined coordinate system does not load by default.	SF01066297, SF01245221
Bug	Whenever GNSS1 or GNSS2 is (0,0,0) then the calculated/calibrated GNSS Distance and Height is wrong.	SF01183203
Bug	Strange "jumping" between lines in Auto Snap MC1.	SF01196500
Bug	Model creation fails when creating a drill pattern using point and heading.	SF01236816
Bug	Verify CAN swap message and restart panel message.	SF01239361
Bug	Perpendicular offset in 2D no longer available or works.	SF01250157
Bug	Cannot adjust height for laser catcher on the right side.	SF01269004
Bug	Cannot use X-Direction! Slope setting in 2D is not consistent.	SF01271708 SF01281019 SF01315053 SF01319161 SF01319769
Bug	Surface log on models in sub folders not synchronising to ConX.	SF01294728
Bug	Switching between projects with different models crashes MC1.	SF01108227
Bug	Tool position is wrong after update to 6.6.2- FlexiROC machines.	SF01316209
Bug	Semi-auto with Liebherr G8 and TiltRotator - Flickering Auto.	SF
Bug	Side distance for bottom bullseye is wrong after the upgrade.	SF01303630
Bug	Adding a tool to Vermeer machine does not work.	SF01269428

Bug	Not possible to edit length of line in create model (6.6).	SF01293155
Bug	Height window not available in 2D.	SF01280744
Bug	Arc in MC1 not shown correct.	SF01261783
Bug	Not being able to upgrade the MCP80 due to the same HWID.	SF01236448
Bug	MC1 sending incorrect token to ConX, cannot display fw-version for download.	SF01242058
Bug	Controller screen (5th run screen) for Asphalt paving machines becomes unusable when Italian language is used.	SF01242763
Bug	6-Way angle drifts and sticks at incorrect value (Flat ground).	SF01271182 SF01316457 SF01316458 SF01322040 SF01316459 SF01327346
Bug	Random crashes on Excavator solution - Hold slope related.	SF(Aus/NZ)
Bug	Surface log connects big gaps after synchronising with ConX.	SF01136767
Bug	Offset jumps when it's set to 0.	SF01327286
Bug	No contact with 2D warning persistent (grader) - mast slope and main fall in some cases.	SF01272811
Bug	Wrong machine position is sent to / visualized on ConX Track page.	SF01119101 SF01126067
Bug	Active reference model on ConX is not updated.	SF00994627 SF01142170
Bug	Machine appears offline in ConX but is online.	SF652939
Bug	Failed holes are horizontal when using Sandvik interface.	SF01134236