



**2D Guidance
James Fisher
Prolec
Systems**



2D Guidance James Fisher Prolec Systems User Guide

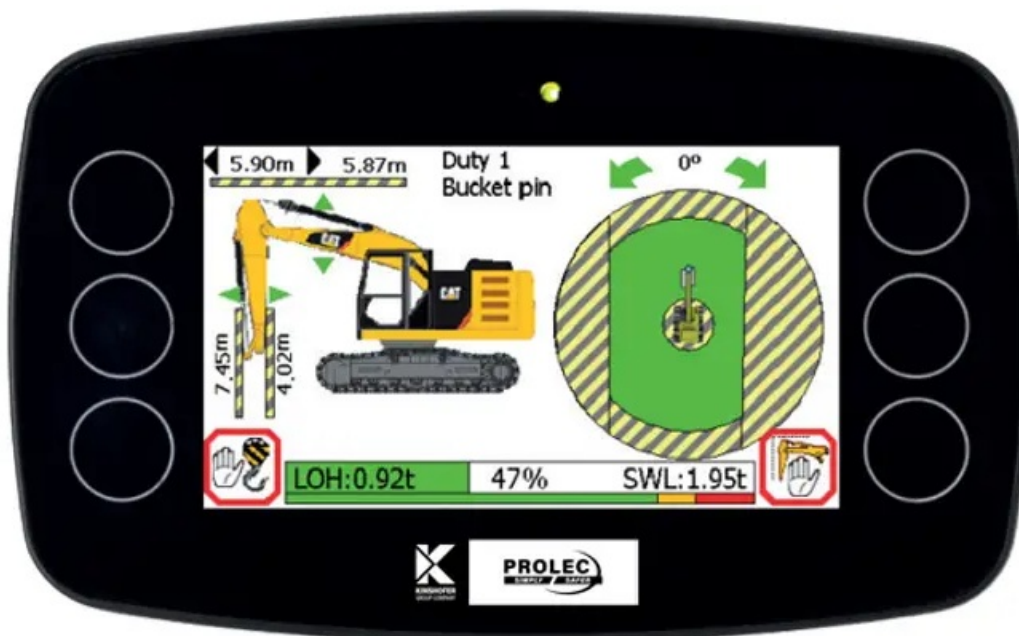
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2D Guidance James Fisher Prolec Systems



Product Usage Instructions

- Refer to the glossary for key terms related to the product operation.
- Excavation mode includes features like bench reference, flat target surface, and distance measurement.
- The main screen displays the left view (machine arm), right view (tool window), and slew circle.
- The main menu options vary based on operator/supervisor level and active mode (Excavation or Lift).
- In the 2D configuration menu, change the Reference Now button function to align with specific requirements.
- In the Job settings menu, configure bench/target heights, grades, and other job-specific parameters.
- After setting up the job in the configuration menu, return to the main screen to verify the settings before starting excavation.
- Set job type and reference type to align with the desired digging parameters. Use the Reference Now button to establish correct height references.

FAQ

- **Q:** How do I change the reference type?
- **A:** Navigate to the 2D Configuration menu and select the desired reference type from the options available.
- **Q:** What does the bench offset parameter do?
- **A:** The bench offset sets the bench/reference height relative to the site datum, allowing for accurate referencing during operation.
- **Q:** How can I verify my job settings before digging?
- **A:** After setting up the job in the configuration menu, return to the main screen to ensure that the settings reflect your requirements accurately.

Typical Operation

- Excavation Mode with Tool Sensor

Main Screen



Left view

Dig view (machine arm)

- **Orange line:** "Bench" reference
- **Green area:** Flat "target" surface
- **Dotted line:** Bottom of tracks
- **0.21m:** Distance between tooth and target depth



Right View



"Tool window" (top)

- Zoomed view of tool
- Selected tool point (red dot)
- View of any target cross-grade

"Slew circle" (bottom)

- Current machine slew angle
- Active slew limits

- Press any button to reveal up to 6 functional buttons



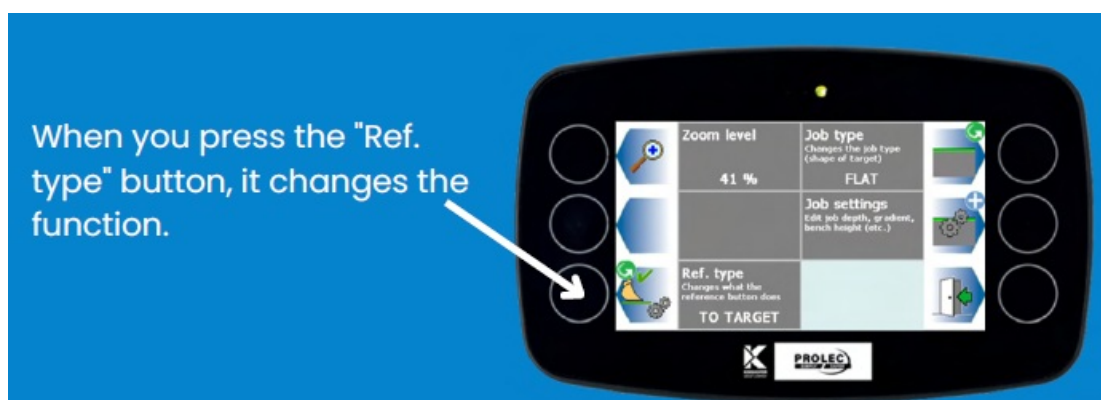
Main Menu

- The menu shown will depend on operator/supervisor level, and whether Excavation mode or Lift mode is currently active.



Setting reference type

- How to change the "Reference now" button on the main screen does
- Go to "2D Configuration" on the main menu



This affects what the "Reference now" button does on the main screen. The options include

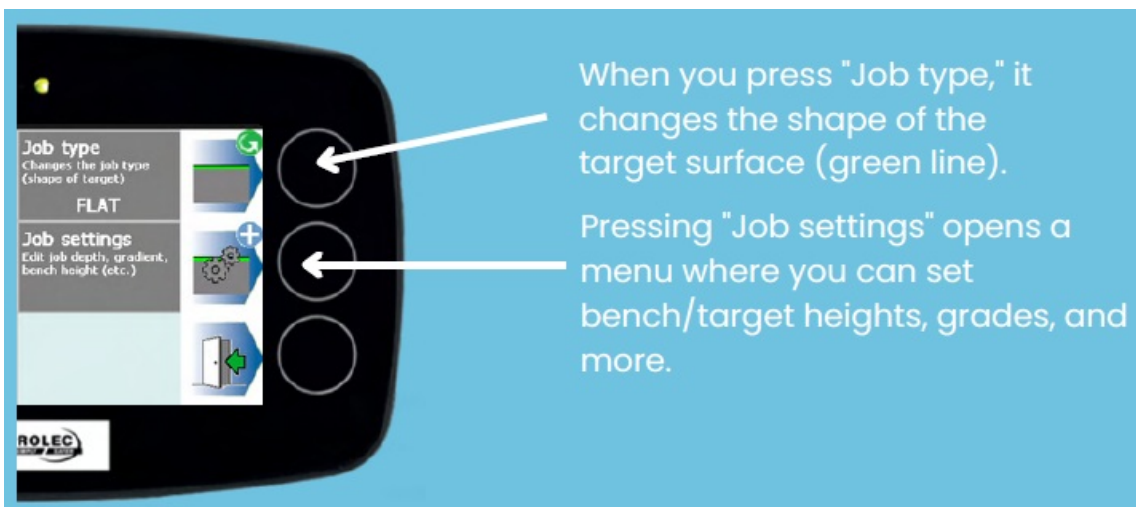
- "TO TARGET": When the cutting edge is at the target depth
- "TO BENCH": When the cutting edge is at bench height (survey stake or laser line)
- "TO HEADING": When the machine is aligned with a set direction
- "TO POINT": When the cutting edge touches a point on the current profile/job

The "Reference now" button image has been updated. Now, it aligns the bench height line to the cutting edge, as indicated.



Setting up the job

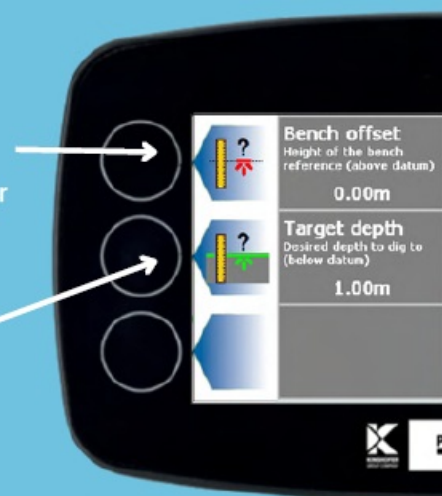
- In the 2D configuration menu, we can set up the job to reflect our requirements



- The options in "Job settings" vary with the job type.
- For flat jobs, it's just bench and target settings.

"Bench offset" sets the bench/reference height relative to the site datum. For example, here we have set "bench" to be an object or line exactly at the site datum. The operator can touch this object to reference to the bench.

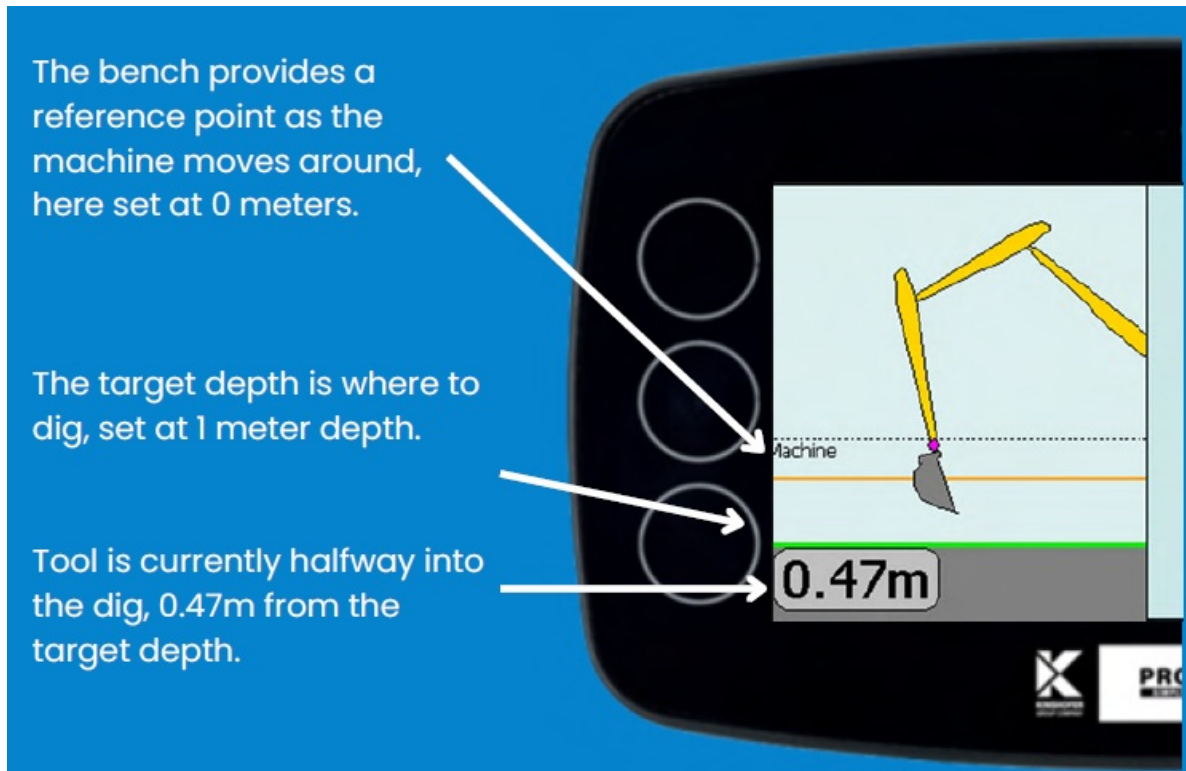
"Target depth" sets how deep the target is below the datum.



Ready to dig

- In the 2D configuration menu, set up the job to reflect the requirements

- Once setup is complete, return to the main screen, which shows how settings are reflected.



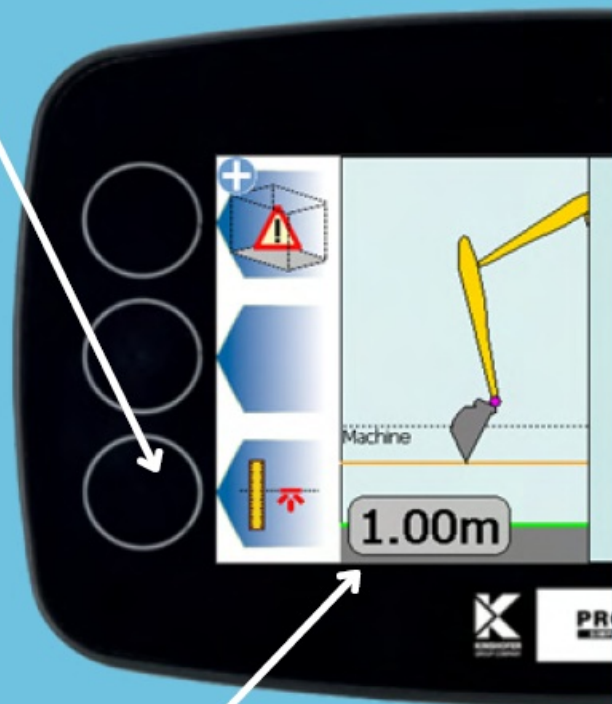
Using 2D digging

- Following our current example, we've set the job type to "flat", with a 1m target depth

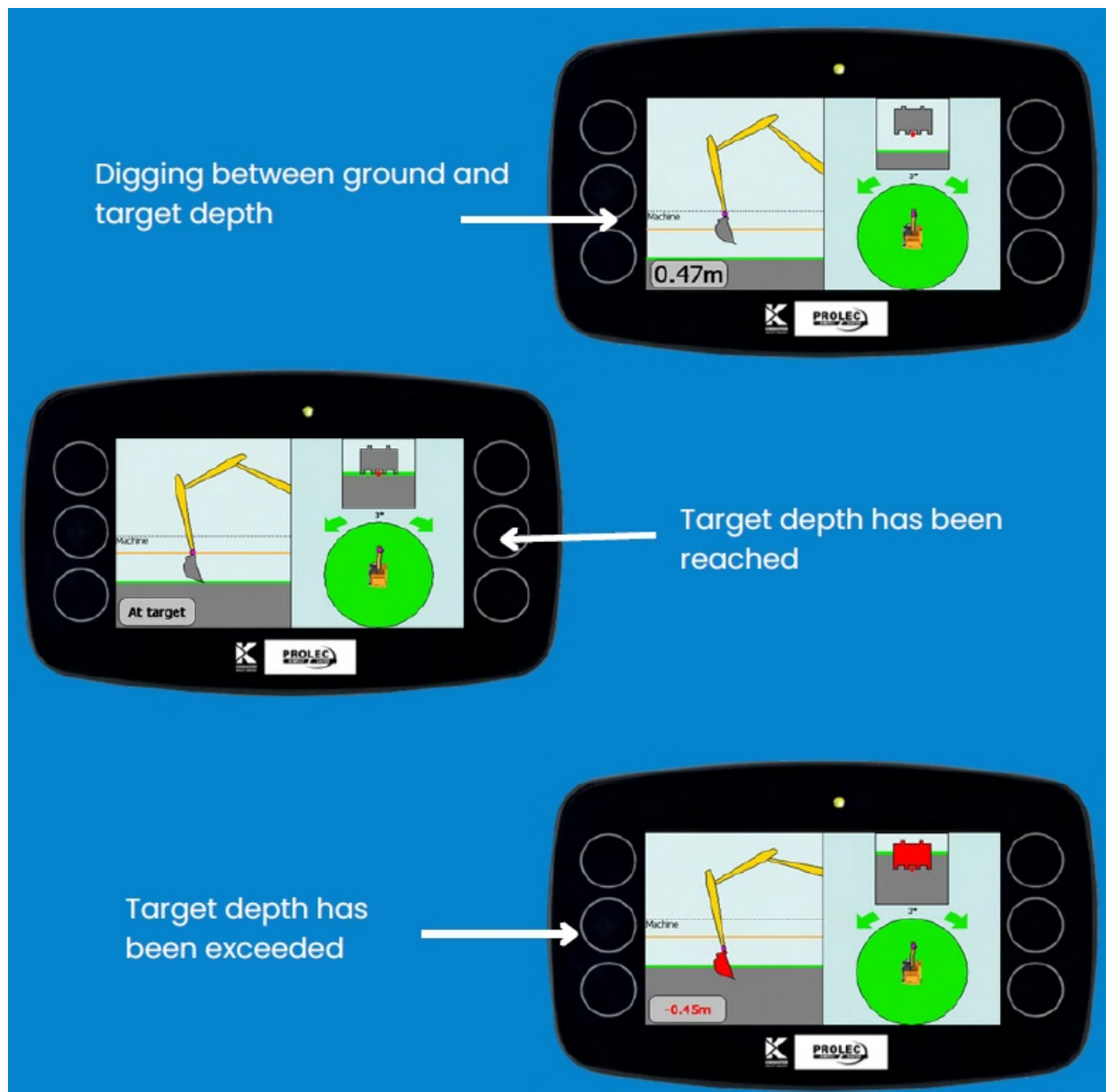
The reference type is set to "To bench," so when the bottom left button is pressed, the bench height on the screen aligns with the cutting edge.

When you use the bench as the starting point, think of it like placing the bucket on the ground before digging. Then, press the "Reference now" button to tell the system the correct height to use as a reference.

After referencing, the distance to between the cutting edge and the target depth is "1.00m," as expected.
(The distance between the datum and target was set to 1m.)



- Now we can start digging. Dig the desired hole, using the value on the screen to confirm the required depth



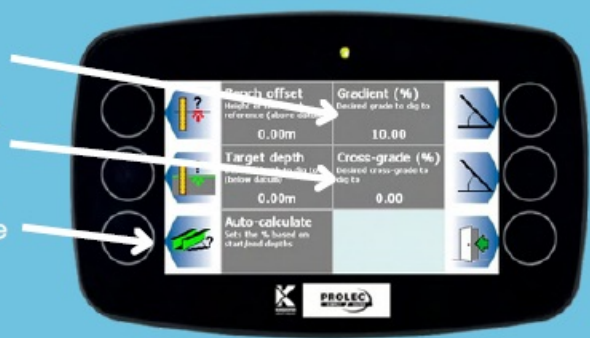
Gradient job – Setup

- A gradient job is similar to a flat job, but the ground follows a known % grade (and/or cross-grade)



- There are more job settings in gradient mode.

- Gradient is the % grade seen when looking forwards from the cab
- Cross-grade is the % grade seen left-to-right from the cab
- "Auto-calculate" calculates the grade for you, given a start-height, end-height, and distance



- Bench offset and target depth work similarly to a flat job, however the target will be at a gradient, so the depth is applied only when referencing
- Back on the main screen, the reference type has changed, and we can see the 10% target gradient

Referencing to target will align the cutting edge to a point on the slope

The target depth is set to 0m, so at this point we can see our bench and target are at the same level.

If the depth was 1m, the orange line would be 1m above where it is now.



Gradient job – Usage

- To make the best use of the gradient job type, follow these steps

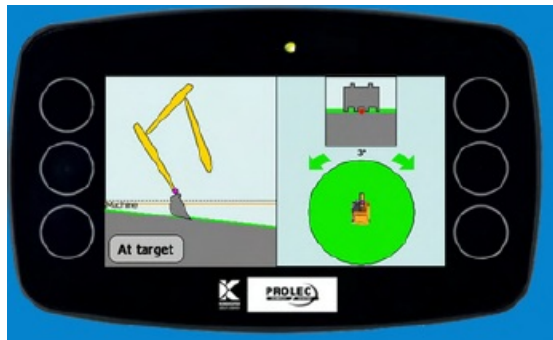
Extend the machine to full reach and place on the ground at start of the dig, and press "Reference now".

The tool point will be aligned as we have seen before.



Proceed to dig along the gradient using the target depth indicator as a guide

- The full length of the machine has been used



Track backward so that the last-dug point is at full reach

Then re-reference to that depth, and continue digging the slope

- So long as the correct heading is maintained, any size of the area can be dug to a grade using this process of digging and referencing.

Gradient job – Job settings

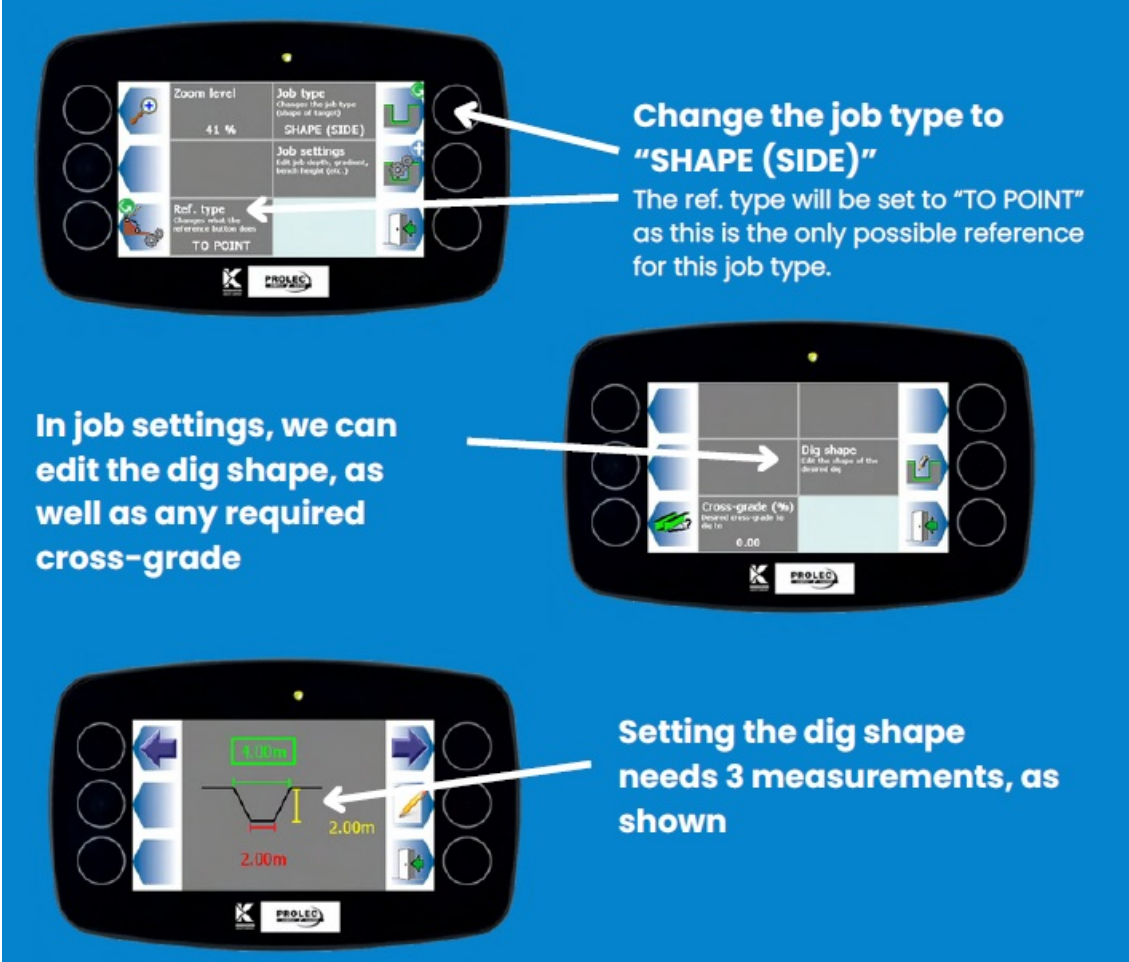
Edit the cross-grade value in job settings

The tool window will show the target cross-grade

- Note that cross-grades are left-to-right from the operator's perspective, and normal grades are uphill (looking forward).
- Negative values can be used if required, to dig in the alternative direction.

Complex shape job – Setup

Side-on perspective



Change the job type to "SHAPE (SIDE)"
The ref. type will be set to "TO POINT" as this is the only possible reference for this job type.

In job settings, we can edit the dig shape, as well as any required cross-grade

Setting the dig shape needs 3 measurements, as shown

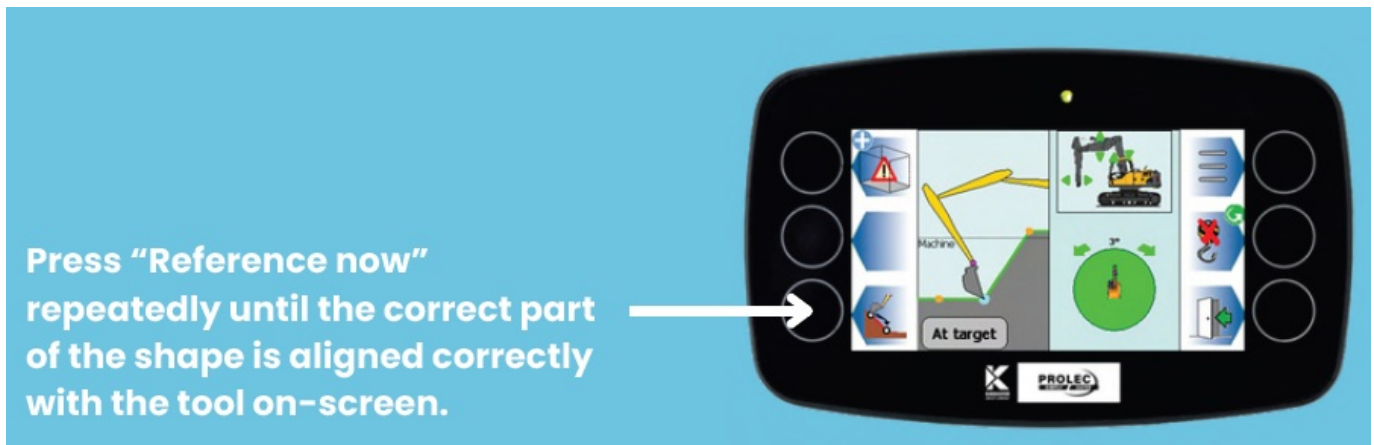
- Back at the main screen, we can see that the shape of the job has become more complex, according to the measurements we set.



Complex shape job – Usage

- Side-on perspective

- Start by picking a known reference point, then position the cutting edge on it.



- (the current active point on the complex shape is shown in blue)
- Then dig using the target distance indicator as a guide.
- Digging below the surface, but above target depth



- Target depth has been reached

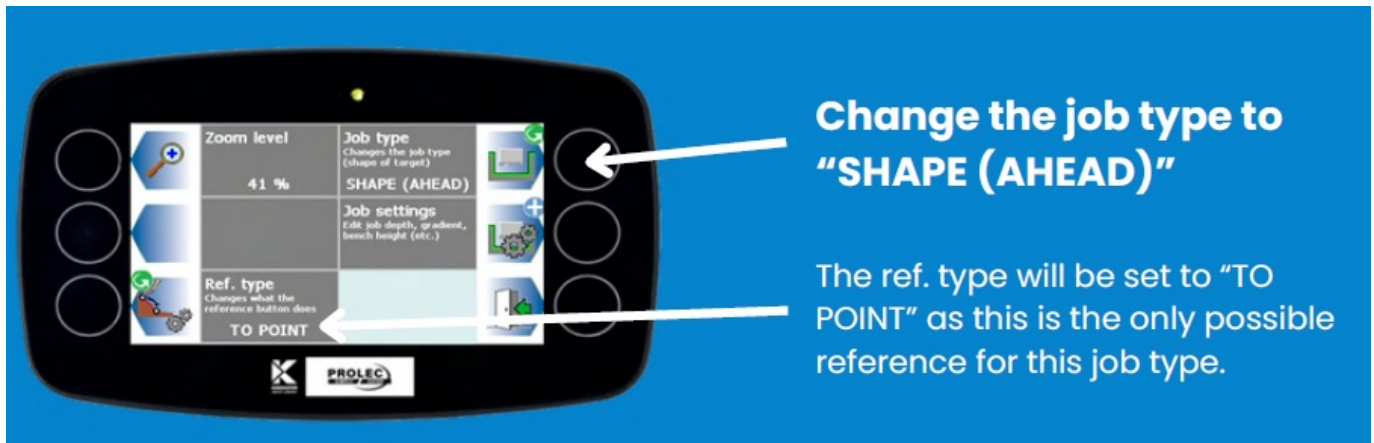


Complex shape job – Trench

Head-on perspective

- This job type is similar to the previous one, except the viewing position is head-on rather than side-on. This can

be useful for digging trenches.



Job settings are identical to the "SHAPE (SIDE)" job type

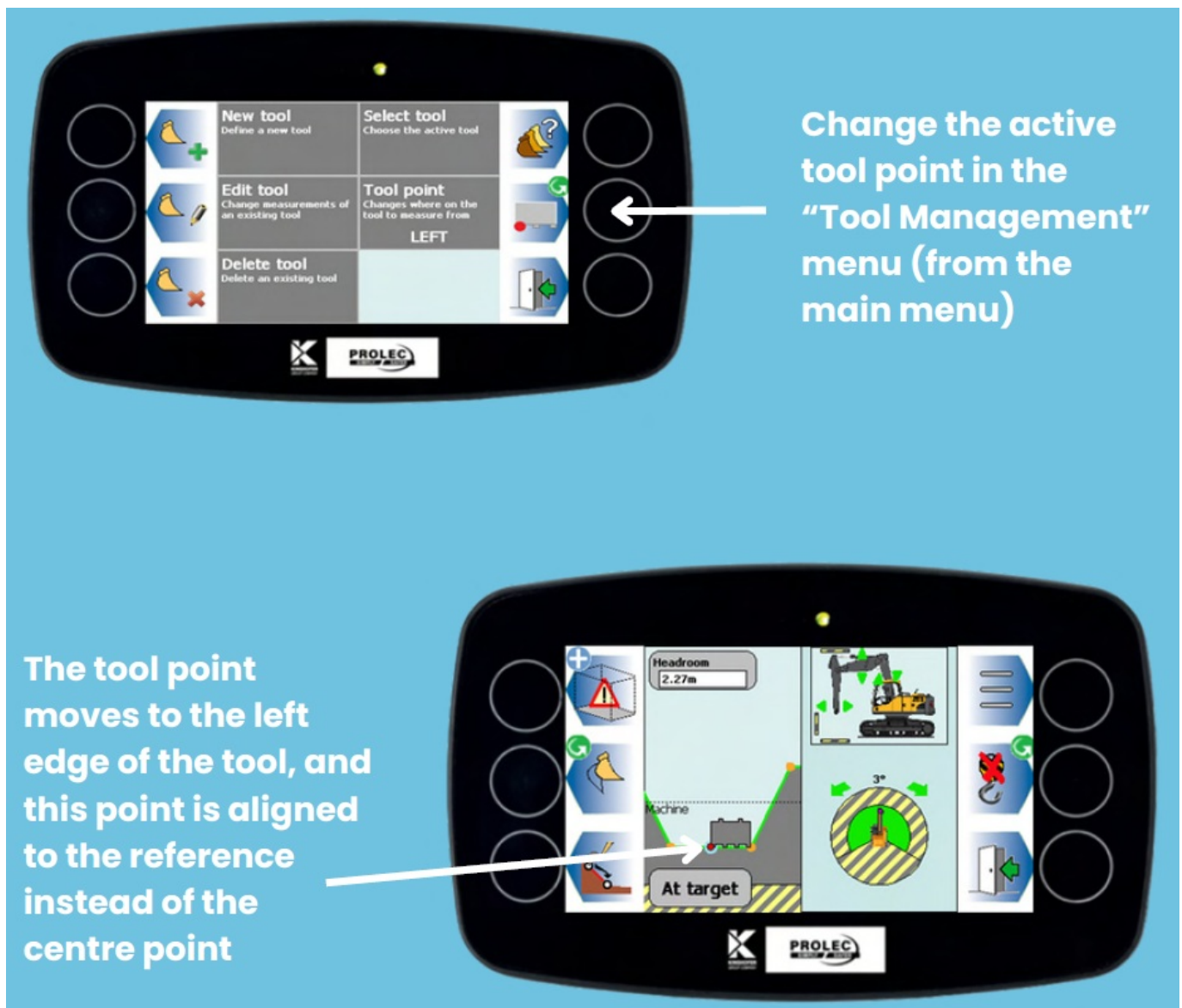
- The cross-section can be seen ahead of the operator, and a depiction of the tool is shown.



Complex shape job – Trench

Head-on perspective

- The active tool point is shown in red and can be switched between center, left, and right.
- This part of the tool is aligned to the selected reference point when the "Reference now" button is pressed.

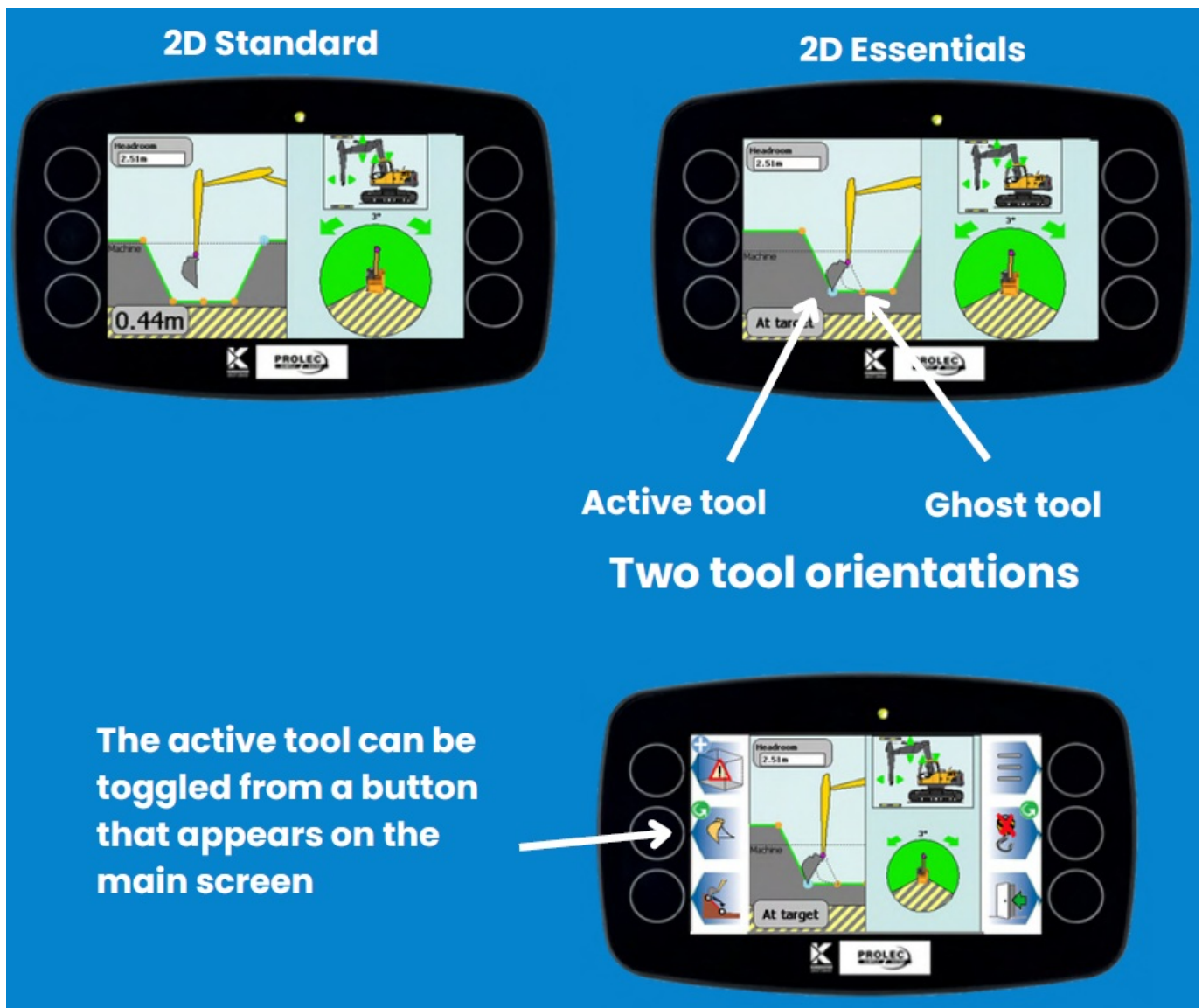


2D Essentials

- 2D Essentials may be used on machines without fitting an additional tool sensor.
- (contact your local dealer to activate 2D Essentials on an existing PME installation, simply with a software upgrade).

How to tell if you have 2D Essentials or 2D Standard

- In 2D Essentials, the bucket on the screen shows two possible positions at the same time: one "flat-bottomed" bucket and one "crowded-out". One is active and the other is displayed as a "Ghost tool".
- In 2D Standard, the real position of the bucket is shown in real-time.

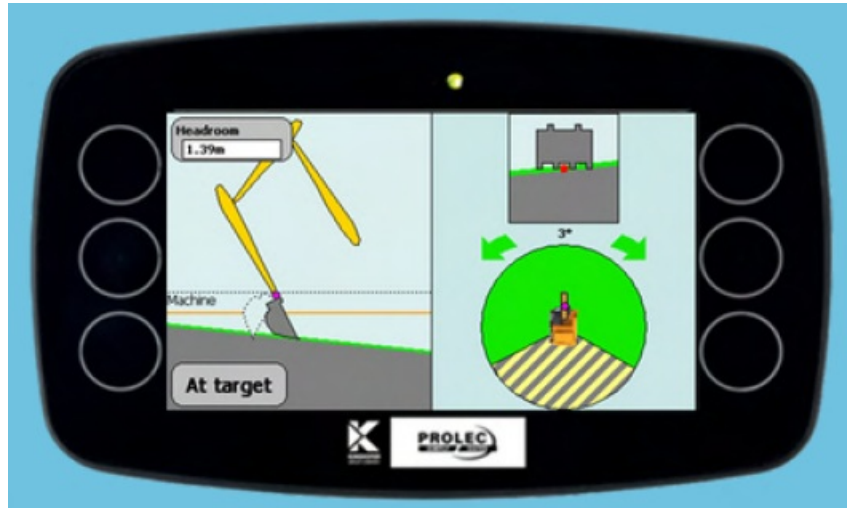


2D Essentials – Usage

- Digging using 2D Essentials is the same process as using 2D with a tool sensor. The difference is that the tool on the screen will not reflect the real angle. The two orientations, however, can be used with some operator intuition to sufficiently dig any job.
- In this example, a 10% gradient is dug identical to the job we performed before using a tool sensor
- Just as before, start by referencing at the start of the slope. Using the crowded-out orientation is best for this.



- Once underway and at a sufficient position to allow for flat-bottom finishing, the orientation can be switched in a single tap and the operator can continue in this orientation, using the target distance as a guide as normal.



PME Limits

Limits on height and slew can be set while digging with 2D. Access these from the limits menu using the button on the main screen.

Consult the PME 100–500 Quick Start Guide for assistance.



- We've set up a height limit. Height and depth limits are shown on the 2D display.

Current headroom can be seen top left



The hatched area shows the active limit



Warnings are shown when at or close to a limit

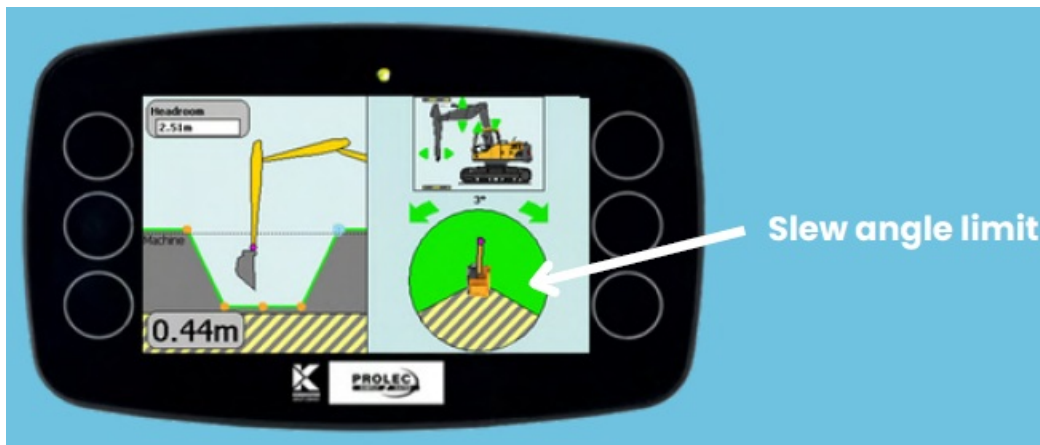


IMPORTANT: Note that motion cuts may be enforced for PME limits, but are independent of 2D guidance. PME will not stop you at a 2D target depth, it will only stop you at a PME Depth Limit.

- Slew limits, cab-protection and maximum-reach limits may also be set.
- Consult the PME 100-500 Quick Start Guide for assistance.



- These limits are shown in the slew circle



- Arrows show safe directions of movement. Green indicates unrestricted movement, amber shows a slowdown, and red shows that motion is cut.

Arrows show safe directions of movement. Green indicates unrestricted movement, amber shows a slowdown, and red shows that motion is cut.



IMPORTANT: Note that motion cuts may be enforced for PME limits, but are independent of 2D guidance. PME will not stop you at a 2D target depth, it will only stop you at a PME Depth Limit.

Choosing a tool

In the main menu, press "Tool Management".



- Tools can be created/edited/deleted here so that correct measurements are used



- To create or edit a tool, set a name, and then enter five measurements



Lift mode (also known as RCI)

- Pressing the middle-right button switches between excavation mode and "Lift mode" (RCI), and back again.

- Consult the PME 100-500 Operator Manual for assistance.

Left – Lift view panels

- Lift point height
- Lift point radius
- Headroom, if height limit active
- Load on Hook, Safe Working Load

Right – Limits info

- Movement arrow indicators (top)
- Slew circle (bottom)



Pressing any button reveals up to 6 functional buttons

Left buttons

Limits



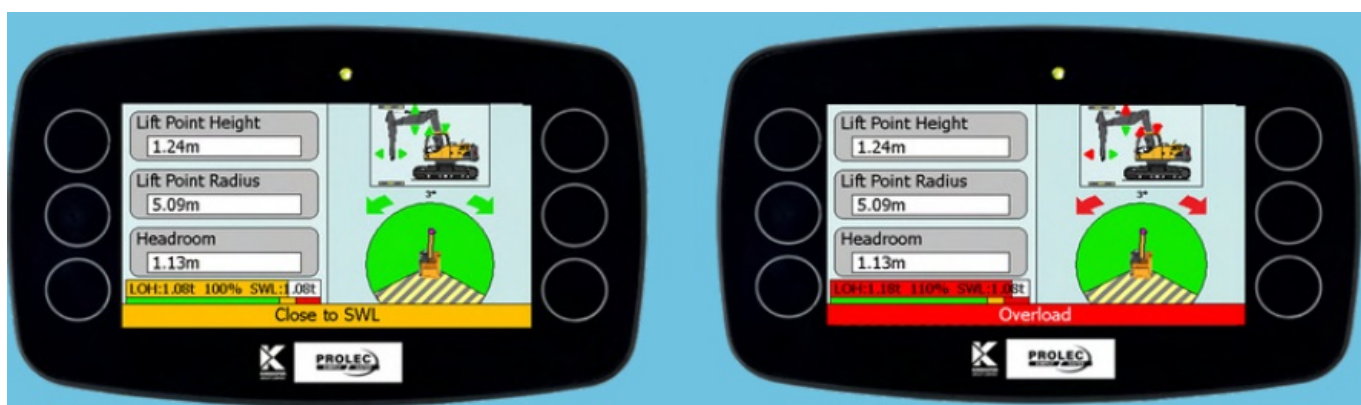
Right buttons

Main menu

“Lift mode” toggle
(currently on -
excavation mode off)

Hide buttons
(as in above image)

- Warnings show when overload and movement arrows show safe directions



Glossary

- **Bench** – A “reference” height or depth for determining the machine’s height relative to the site. An example might be a laser beam, survey stake, or a piece of ground at a known height. May be the same as the datum, or offset by a constant amount.
- **Datum** – a known “zero point” for the site, from which other heights and depths are measured. May be the


same as the bench height, or offset by a constant amount.

- **Dig Mode** – see Excavation mode
- **Excavation mode** – System mode for 2D digging to a depth, gradient, or complex shape. Also known as Dig Mode. Cannot be used at the same time as Lift Mode.
- **Lift mode** – System mode for lifting large objects as a crane. Displays: Load on Hook, Safe Working Load, Tool Point height & radius. Cannot be used at the same time as Excavation Mode.
- **Limits** – Height and Slew limits. Enforced using motion cuts to prevent the machine from exceeding the limit.
- **Referencing** – aligns the on-screen machine to the “bench” at different real-world points/levels.
- **Target** – The surface that you wish to dig to. An example might be a target depth, a grade, or a complex shape.


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Documents / Resources

	<p>PROLEC 2D Guidance James Fisher Prolec Systems [pdf] User Guide DAF8NE8u18Q, BAFZzsFE5Fo, 2D Guidance James Fisher Prolec Systems, 2D, Guidance James Fisher Prolec Systems, James Fisher Prolec Systems, Fisher Prolec Systems, Prolec Systems, Systems</p>
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References

-  [Prolec ► Transforming Construction Safety & Efficiency](#)
- [User Manual](#)

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