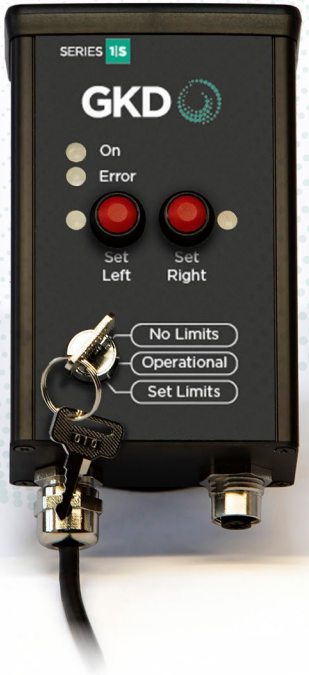
SERIES 1|S

USER MANUAL



M1000007 V1.3 - 11/2021

GKD

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SERIES 1-S INTRODUCTION

Series 1-S is a stand alone slew limiter intended for use on hydraulic excavators and similar machines where an upper structure rotates relative to the base structure, and where slew limits are required.

Series 1-S monitors the slew position of the machine by means of counting of the teeth on the slew ring, and limits the slew movement of the machine to between two points which are set by the machine operator.

Pre-emptive stop algorithms will monitor the speed of approach to the limit and will progressively apply the motion cut earlier the faster the speed of approach, ensuring the machine stops before the limit is breached.

SWITCHING SLEW LIMITS ON AND OFF

Slew limits are enabled or disabled using the key switch on the front of the in cab display. The key switch has three possible positions:

- No Limits
- Operational
- Set Limits

With the key switch in the “No Limits” position no slew limits are enabled and the machine will be free to slew in both directions without interference from the 1SL system.

With the key switch in the “Operational” position, the stored Left and Right slew limits will be activated. Slew movement of the machine will be limited to within the range between the stored Left and Right slew limits. The key may be removed from the switch in the “Operational” position to prevent the slew limits being altered or disabled.

SWITCHING SLEW LIMITING OFF

Turn the key switch to the “No Limits” position. Slew limiting will be disabled, and the machine will be able to slew in both directions without restriction.

SETTING SLEW LIMITS

To set slew limits, turn the key switch to the “Set Limits” position.

Slew the machine to either the desired Left or Right slew limit position, and press the appropriate button on the Series 1-S display - “Set Left” sets the counter clockwise slew limit, and “Set Right” sets the clockwise slew limit. Once one limit has been set, slew the machine to the opposite limit position and set the second limit.

Both Left and Right slew limits must be set in order for the Series 1-S system to work. The order of setting limits is not important, either the Left or Right limit may be set first. The dual colour LED next to each button will momentarily change colour as the button is pressed to store a limit.

Once both limit positions have been stored, turn the key switch back to the “Operational” position and remove the key if appropriate to prevent the limits being altered or disabled.

NOTE: WITH THE KEY SWITCH IN THE “SET LIMITS” POSITION, MOVEMENT IS UNRESTRICTED IN BOTH DIRECTIONS, AND NO SLEW LIMITS WILL BE OPERATIONAL. THE KEY SWITCH MUST BE TURNED BACK TO THE “OPERATIONAL” POSITION TO ACTIVATE THE SLEW LIMITS.

THE SERIES 1-S IN USE

With the slew limits set and the key switch turned to the “Operational” position, slew movement will only be allowed between the stored Left and Right slew limits.

As a limit is approached the Series 1-S system will apply the appropriate motion cut to stop slew movement towards and through the limit. Slew movement back away from the limit will be allowed.

The two LED lamps alongside the Set Left and Set Right buttons will indicate motion cut status during use. When a motion cut is applied, the LED associated with that direction of slew will turn RED.

When movement is allowed, the LED will show as GREEN.

Should the limits be set and the machine moved to a position outside the set limits with the key switch in the “No Limits” position, when the key switch is turned to the “Operational” position the Series 1-S will determine the shortest direction to be within the allowed limits and will only allow the machine to move in that direction. Once the slew position is within the allowed zone, normal operation will commence automatically.

SPEED OF OPERATION AND PRE-EMPTIVE STOPPING

Series 1-S will calculate the speed of slew movement towards a limit and will apply the slew motion cut progressively earlier as the slew speed increases, thus movement at speed towards a limit will result in the slew motion cut being deployed earlier to prevent the machine momentum carrying the structure through the limit after the motion cut has been deployed.

Once the motion cut valve has been deployed, Series 1-S will assess the stop position of the machine. If further movement towards the limit is still available once the machine has stopped the motion cut valve will release again after 1 second and allow further travel towards the limit. Once the limit has been reached, no further movement towards the limit will be allowed. Movement away from the limit will be allowed.

In order to maintain smooth operation, approach the stored limits at a slow slew speed. This will prevent the Series 1-S cutting movement early.

SERIES 1|S

GKD Technologies reserve the right to change these instructions in line with the policy of continuous improvement.

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