A load monitoring system delivers a smarter, safer sidelifter
What is SMARTlift?

► Steelbro SMARTlift Load Monitoring uses its intelligent software and sensors to monitor and control the sidelifter lifting operation every 50 milliseconds.
► Microcontroller based control system
► Incorporates intelligent safety features
► Predicts and prevents unstable situations
► Optional control system for SB362 and SB450 Steelbro sidelifters
► On board diagnostics for easier fault finding
SMART lift Evolution

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Why Choose SMART Lift?

► Maximise the productive life of the sidelifter – undue stress and overloading is prevented

► Maximise the productivity of your sidelifter and gain insight into your business by utilising the feedback and information from data logs and service notifications

► Mitigate risk for employees/operators

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SMART lift Features

- Weighing Function
- System Protection
- Instability and Overload Protection
- Safety Interlocks
- Self Diagnostics
- Manual Override
- Data Logging & Service Warning

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Instability Warnings

If sidelifter load moves towards a position of instability a warning sound is heard (horn) and screen message is displayed - Continued operation will be prevented.

► Lifting Side instability
  • Warning will sound at 80% of the tipping load
  • Outward hydraulic movement is stopped at 90% of the tipping load

► Off Side instability
  • G pin will not be allowed to move across the Sidelifter centre line.

► Prevents lifts on dangerous cambers and elevations
Overload Protection

SMART lift provides overload protection by preventing lifts where the weight of the container is greater than the maximum lift capacity of the sidelifter.
Data Logging & Service Warnings

► Load Profile Data is captured including type of lift and weight giving owners a detailed history of their unit. This helps with service requirements and the resale value.

► Payload measurement displayed

► Records use of override protection

► Logs major alarm occurrences

► System records engine hours

► Service Warning alert displays when service is due
Self Diagnostics

► Automatic Fault Detection

- The system will detect common electrical faults such as wire breakages and short-circuits in the angle sensors, pressure sensors and the stabiliser.

- If the system detect a fault then a warning horn sounds and a screen message indicates where the suspect sensor is located.

- Angle and pressure sensor failures stop the operation of the Sidelifter.
Safety Interlocks

► Arm Mode
  • Stabiliser on ground before arms will work

► Stabiliser Mode
  • Disabled if there is any load on the lifting pin and a warning sound (the horn) and screen message is displayed

► Traverse Mode
  • If the stabiliser is extended for any distance, Traverse mode is disabled and a warning sound (the horn) and screen message is displayed.
System Protection

Engine Protection

► Over temp
  • Warning over
  • Engine shut down after 30 Seconds

► Low Voltage
  • Warning under
  • Engine shut down after 30 Seconds

► Low oil Pressure
  • Warning
  • Engine shut down after 30 Seconds
Override Protection

► Temporary Override
  • manual override mode safety features of the load monitoring system are disabled and the operation of the arms is extra slow

► Permanent override code
  • This is randomly generated in rare circumstances using a random numbering system. This gives the owner greater certainty that the safety system is turned on.
Container Weighing

► Provides container weight as part of normal lift
► +/- 100Kg increments
► Calibrated weighing system
SMARTlift System Overview

The CAN bus

ENGINE ECU

FRONT CRANE ECU

REAR CRANE ECU

DISPLAY

RADIO RECEIVER

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Each crane is equipped with an Electronic Control Unit (ECU) which monitors the following Sidelifter parameters:

- Stabiliser angle
- Stabiliser extension
- Stabiliser foot in contact with ground
- Bottom lifting arm angle
- Top lifting arm angle
- Top lifting arm hydraulic cylinder pressure
- Trailer camber and elevation
Sensor Locations

- Top Arm Angle Sensor
- Bottom Arm Angle Sensor
- Stabiliser Angle Sensor
- Crane Module Angle Sensor
- Top Arm Cylinder Pressure Sensor
- Stabiliser Extension Count Sensor
- Stabiliser Extension Reset Sensor
- Stabiliser Deployed Microswitch
- Castellated or Magnet Strip
- Stabiliser Extension Reset Magnet (both ends)

ECU
SMART lift Display

- Alarms & Warnings
- Estimated Weight
- Sensor Readings
- Service Interface
- Calibrating
- Fault Diagnostics

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Remote Control

► E-stop
► Engine Start
► Horn
► Work Lamps
► Mode Selection
► Traverse
► Stabilisers
► Arms
► Special Options
► Proportional Function Control
For More Information

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Crane Module Overview

**Inputs**
- Angle Sensors
- Pressure Sensor
- Stabiliser Extension Sensors
- Stabiliser Microswitch
- CANbus

**Outputs**
- Danfoss Valves
- Warning Light
- ECU (Electronic Control Unit)
- Magnetic Sensor Count
- Magnetic Sensor Reset
- Encoder Strip
- Magnet

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Engine ECU Overview

1) LOAD SENSE DUMP
2) LOAD SENSE SHUTOFF
3) HIGH / LOW SPEED

WORKLAMPS

HORN

ST ARTER MOTOR

THROTTLE

HIGH / LOW SPEED UNLOADER BLOCK

CANbus