



# **TS350 PAY LOAD INDICATOR FRONT END LOADER OPERATORS MANUAL Version 6 – August 2025**



## **! WARNING !**

THE PURPOSE OF THIS MANUAL IS TO PROVIDE THE USER WITH THE OPERATING PROCEDURES ESSENTIAL FOR THE PROMOTION OF PROPER MACHINE OPERATION FOR ITS INTENDED USE. THE IMPORTANCE OF PROPER USAGE CANNOT BE OVERSTRESSED. ALL INFORMATION IN THIS MANUAL SHOULD BE READ AND UNDERSTOOD BEFORE ANY ATTEMPT IS MADE TO OPERATE THE MACHINE.

SINCE THE MANUFACTURER HAS NO DIRECT CONTROL OVER MACHINE APPLICATION AND OPERATION, CONFORMANCE WITH GOOD SAFETY PRACTICE IN THIS AREA IS THE RESPONSIBILITY OF THE USER AND HIS OPERATING PERSONNEL.

ALL PROCEDURES ARE BASED ON THE USE OF THE SYSTEM UNDER PROPER OPERATING CONDITIONS, WITH NO DEVIATIONS FROM THE ORIGINAL DESIGN. ALTERATION AND OR MODIFICATION OF THE EQUIPMENT IS STRICTLY FORBIDDEN WITHOUT PRIOR WRITTEN APPROVAL FROM ELEC-MECH (PTY) LTD.

BEFORE OPERATING A MACHINE EQUIPPED WITH A SAFE-AID TS350 THE OPERATOR MUST READ THE INFORMATION IN THIS MANUAL CAREFULLY. CORRECT FUNCTIONING OF THE SYSTEM DEPENDS UPON ROUTINE DAILY INSPECTION AND ANY SUSPECTED FAULTS OR APPARENT DAMAGE SHOULD BE IMMEDIATELY REPORTED TO THE RESPONSIBLE PERSON BEFORE USING THE MACHINE.

## Contents

Accurate Weighing .....	3
Weighing Method / Process .....	3
System Use.....	4
System Startup .....	4
Operating Screens .....	4
Bucket Weight .....	5
Error Conditions.....	5
Bucket Only Weighing .....	5
Batch Weighing .....	6
Trigger Angle.....	6
Reset Angle.....	7
New Batch.....	7
Machine Identification .....	8
Enter Material / Product Id .....	8
Customer Name / Id.....	8
Enter Target Weight.....	8
Running Batch .....	9
Cancel Last Bucket .....	10
Stop Batch.....	10
Real Time Clock .....	10
Set Date & Time .....	11
Screen Brightness.....	11
Touch Screen Calibration .....	12
Fuse Protection.....	13
Downloading Logged Files.....	14

## Accurate Weighing

For optimum Weighing Results, use the following tips and guidelines:

- Ensure the bucket is zeroed regularly / before each batch as small weighing inconsistencies may occur due to a build-up of material in the bucket.
- Ensure load lifting motion is steady, stable and smooth with no unnecessary acceleration or unstable movements (joystick and throttle).
- Ensure the machine does not rock forwards and backwards or bounce when loading into the truck.
- Always try to capture the load when machine is stationary i.e. at the truck, not moving over ground / terrain.
- It is always preferable for weighing to occur at the truck as material may fall from the bucket in transit from the pile of material to the truck i.e. the weight at pile and weight at truck may differ.
- It is very important that the bucket is tilted in / rolled back (towards the cab) while performing lifts.
- Always try to weigh the load when machine is on level ground.
- Start the lift well below the Trigger Angle. This ensures that all acceleration and load bounce has been eliminated well before the Trigger Angle is reached.

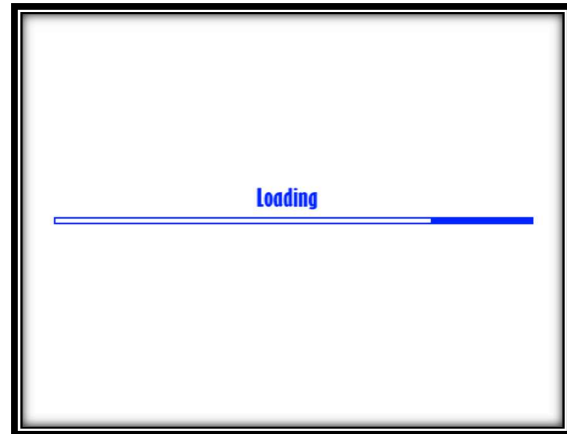
## Weighing Method / Process

The following is the standard day to day process used for accurate weighing:

1. **Warm up** the **hydraulic fluid** performing 4 – 5 lifts of the arm & bucket.
2. **Zero** the **empty bucket**.
3. Enter **Load Truck / Batch Weighing** mode and press **Yes to confirm**.
4. Enter **Target Weight** / Load to be loaded into the truck in tons.
5. **Grab material** and move to the truck with **bucket remaining below Trigger Angle** - do not pass over the Trigger Point as it will record the bucket.
6. When at the truck and the wheel loader is **preferably stationary**, lift the arm in a **steady motion past the Trigger Angle** to record the material.
7. Perform **as many lifts as required** adhering to the above steps to fill the truck to required capacity.
8. **Cancel Bucket** may be used if a correction is required or on final pass (last bucket correction).
9. When finished loading the truck, press on the truck graphic to **Stop Batch**.

## System Use

The Safe-Aid TS350 unit is designed with ease of operation in mind. The system goes directly into the current batch if a batch was running or into a running screen just showing load. All inputs to the system are done by the operator via the touch screen. The touch screen is sensitive to touch therefore it is **not** necessary to **push hard** on the screen (*if touch screen does not work or selects incorrectly see Touch Screen Calibration*).



## System Startup

The TS350 display unit will automatically power up when the machine is switched on and the buzzer will sound once.

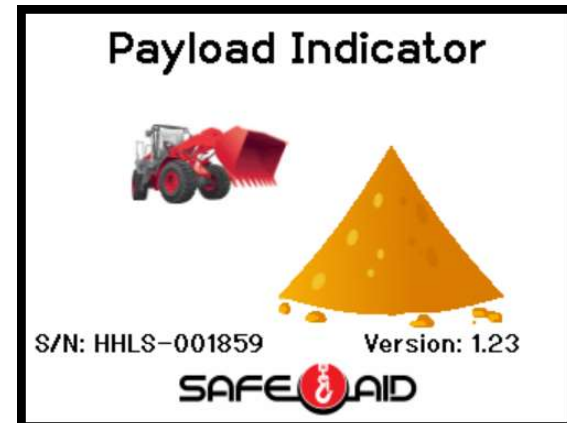
The system will run a CRC (cyclic redundancy check) to make sure that all raw data is correct.

Once the system has completed the CRC the buzzer will sound again, and a set of internal diagnostics (watchdogs) will be utilised to verify that all inputs and outputs are working correctly.

At this point screen calibration can be done if required (see Screen Calibration for process).

This screen displays the display serial number as well as the firmware version:

- S/N HHLS – Serial Number
- Version – Firmware Version



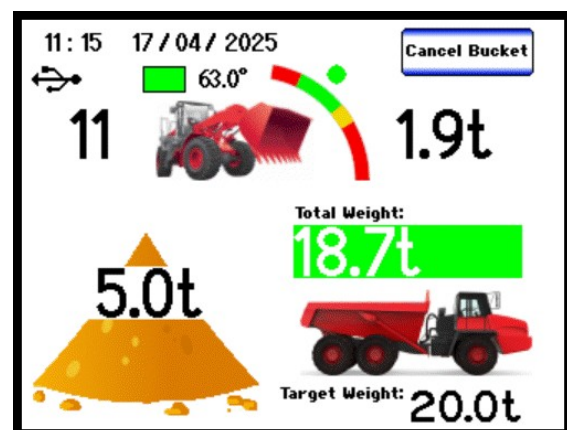
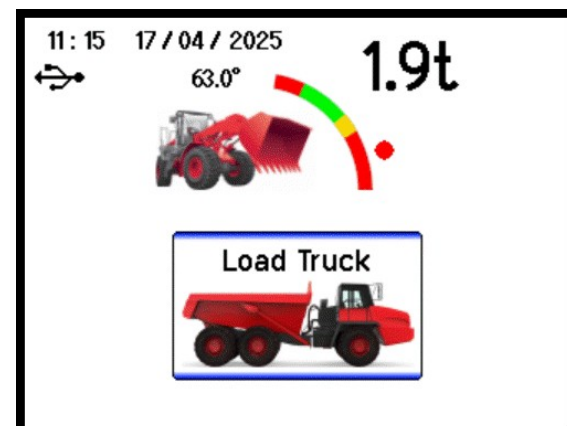
## Operating Screens

The system starts in either of the following screens:

- Load Truck – Batch Stopped
- Running Screen - Batch Running

The following functions can be set:

- Set Date/Time/Brightness and System Information – both screens.
- Start Batch – load only screen.
- Stop Batch – batch screen only.
- Accept Load – batch screen only.
- Cancel Bucket – batch screen only.
- Zero Bucket – both screens.
- Edit Load Angle (Trigger and Reset) – Load Truck screen.



## Bucket Weight

The actual Bucket Weight should always show zero when the empty bucket passes the trigger angle.

Build-up of material deposits on the bucket can cause the zero to change so if the displayed bucket weight is not zero follow the procedure below:

- **Raise Arm to Trigger Angle**
- **Press the Bucket Weight value**
- **Select Yes**
- **The bucket weight will show 0.0t**

## Error Conditions

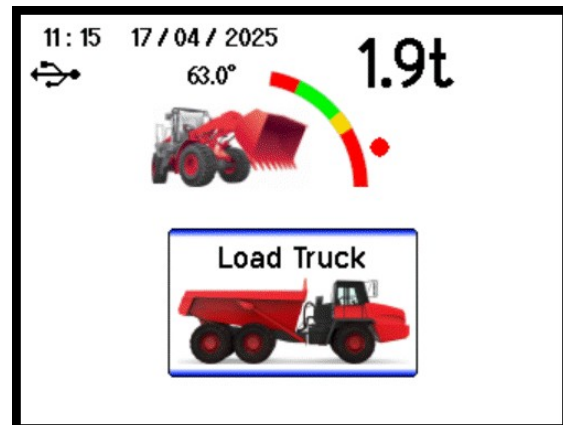
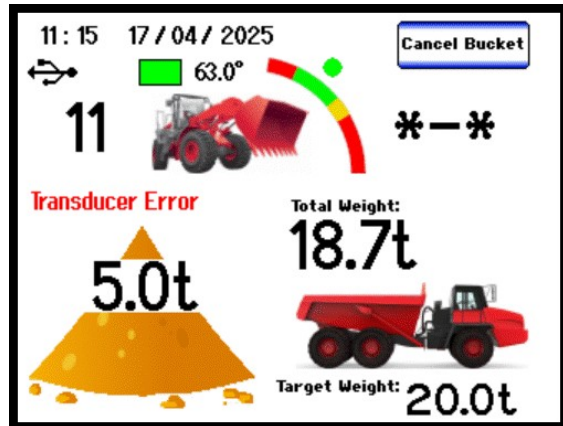
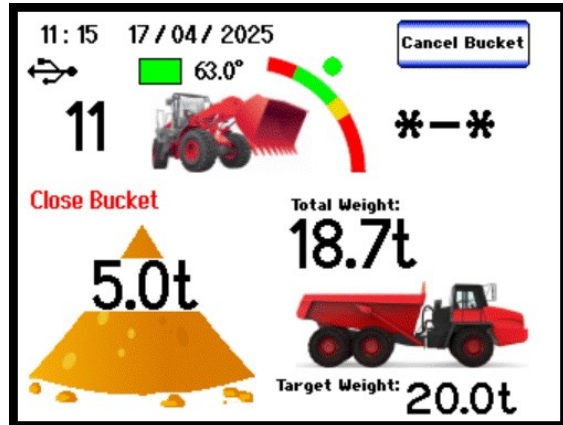
**Transducer Error** – Pressure transducer faulty or damaged cable – Call Installer if this error occurs

**A400NC – No Communication to A400** – The CAN Bus communication line to the A400 board mounted on the arm is faulty – A400 faulty or damaged cable – Call Installer if this error occurs

**Close Bucket** – This may be activated or disabled depending on the installation. A sensor / switch monitors the position of the bucket and if not tilted (towards the operating cab), this may cause an error message to be displayed “**Close Bucket**”. If this message appears, tilt the bucket inwards and the live load will be displayed if in the weighing range. No data will be logged if this error occurs.

## Bucket Only Weighing

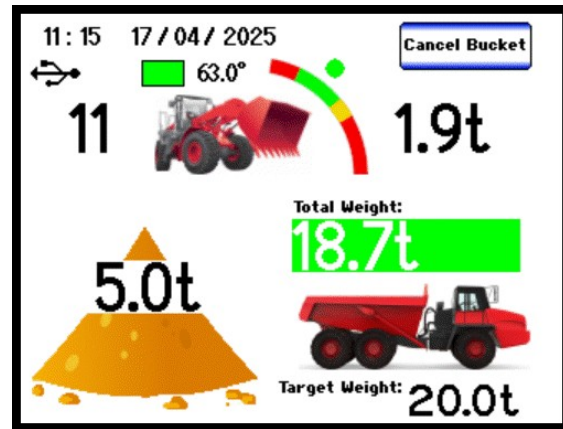
Bucket only weighing can be done if no batch has been started. The bucket weight will be shown but no totalising or batching is done just the load in bucket weight is displayed. No data logging / reporting is logged.



## Batch Weighing

When loading trucks batch weighing can be used to keep record of the following:

- Batch Start Time
- Batch End Time
- Target Weight
- Total Weight
- No. of Buckets
- Individual Bucket Weight
- Machine ID
- Material / Product ID
- Customer ID



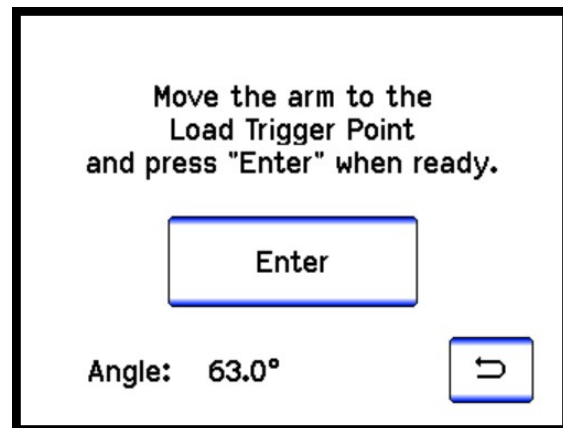
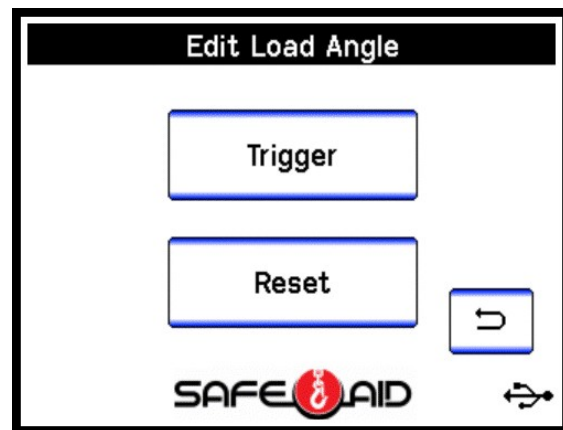
## Trigger Angle

Batch weighing must be **Stopped** to change the trigger angle.

TS350 will capture the load at a predetermined angle when batching. This angle should be set once the height of the truck / trailer has been determined and should be as close to the highest point as possible. **The weighing zone is between 50° and 65° and the trigger angle should only be set within this range.** If multiple trucks are loaded, try and find the best height that will suit all.

- On the Load Truck screen (Batch stopped) Press the **Front-End Loader** picture.
- Select the **Trigger** button.
- Enter the \_\_\_ **Password**.
- Make sure the bucket is at the height required.
- Press the **Enter** button.

If the trucks are different and a new point is required, repeat the process.



## Reset Angle

Batch weighing must be **Stopped** to change the reset angle.

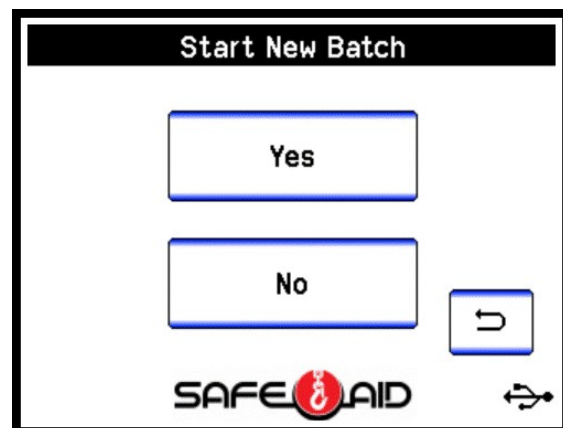
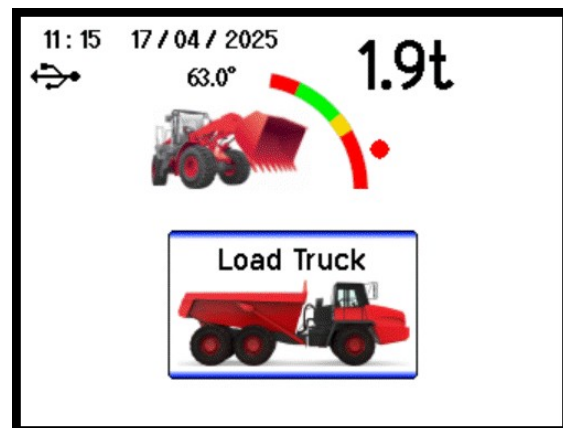
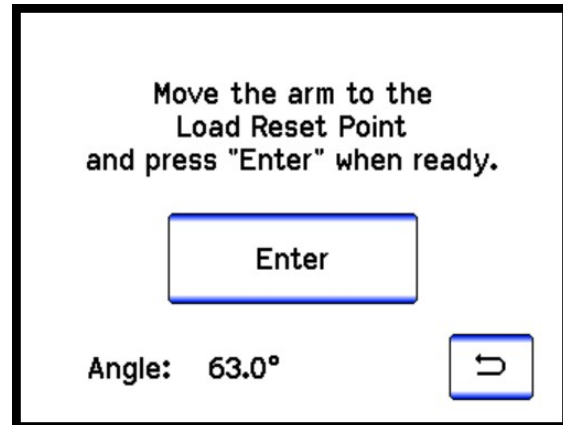
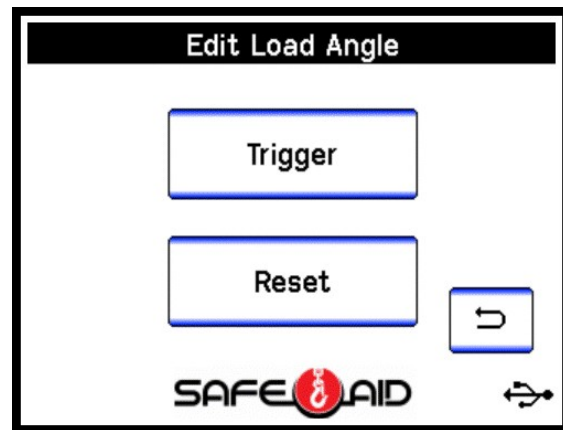
The system will be ready for the next capture once the bucket has been lowered below the reset angle when in batch mode. The reset angle is always set lower than the trigger angle. Within a batch, the system will capture the load at the trigger point and then it will not capture the next bucket load until the arm is lowered below the reset angle.

- On the Load Truck screen (Batch stopped) Press the **Front-End Loader** picture.
- Select the **Reset** button.
- Enter the \_\_\_ **Password**.
- Make sure the bucket is at the height required.
- Press the **Enter** button.

If the trucks are different and a new point is required, repeat the process.

## New Batch

No batch is in process if the bucket weight and the Load Truck picture are displayed. Make sure that the correct Trigger Angle and Reset Angle have been set before starting a batch. Start a new batch by pressing the **Load Truck** button, and then press the **Yes** button to continue.



## Machine Identification

Use the keyboard to type in the Machine ID, Fleet No., or Registration number i.e. identification number of the vehicle that is being loaded. These details are displayed in the final logged data and therefore careful attention should be paid when entering. If the same truck is being loaded the display will keep the last 5 vehicles data until new data is entered.

Machine ID—Fleet No./Registration KPX712GP							
Q	W	E	R	T	Y	U	I
O	P	A	S	D	F	G	H
J	K	L	Z	X	C	V	B
N	M	1	2	3	4	5	6
BKS	SPC	7	8	9	0	"	ENT

## Enter Material / Product Id

Use the keyboard to type in the name or the identification of the product being loaded. These details are displayed in the final logged data and therefore careful attention should be paid when entering. If the same product is being loaded the display will keep the last 5 product's data until new data is entered.

Enter Material Type/Product ID SODIUM PELLETS							
Q	W	E	R	T	Y	U	I
O	P	A	S	D	F	G	H
J	K	L	Z	X	C	V	B
N	M	1	2	3	4	5	6
BKS	SPC	7	8	9	0	"	ENT

## Customer Name / Id

Use the keyboard to type in the name or the identification of the customer. These details are displayed in the final logged data and therefore careful attention should be paid when entering. If the same customer is being loaded the display will keep the last 5 customer's details until new data is entered.

Enter Customer Name/ID National Chemicals							
Q	W	E	R	T	Y	U	I
O	P	A	S	D	F	G	H
J	K	L	Z	X	C	V	B
N	M	1	2	3	4	5	6
BKS	SPC	7	8	9	0	"	ENT



## Enter Target Weight

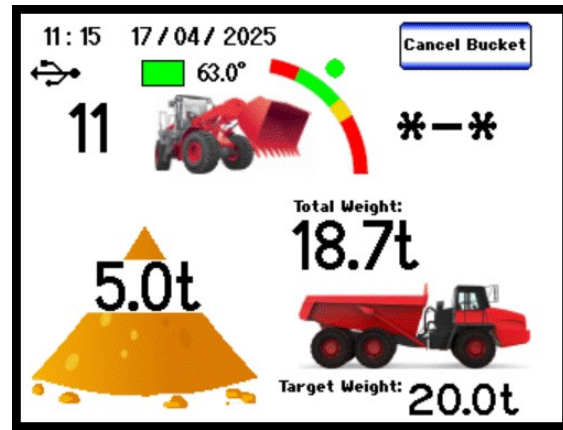
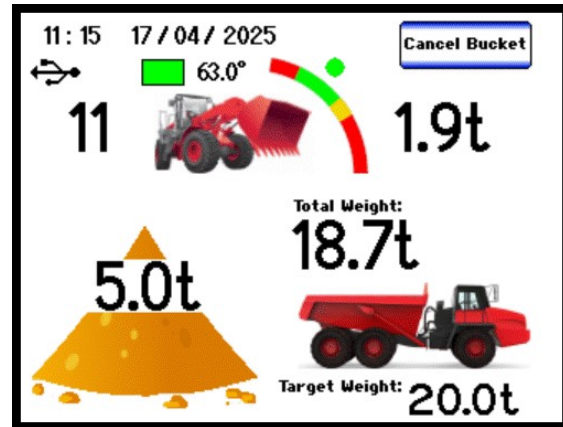
Use the number keypad to type in the target weight required for the vehicle. This total is very important as all calculations are based on this total. Careful attention should be paid when entering. If the same truck is being loaded the display will keep the same data until new data is entered.

Target Weight 50.0t			
0	1	2	3
	4	5	6 ✓
	7	8	9 X

## Running Batch

Start loading the vehicle the display will show the following:

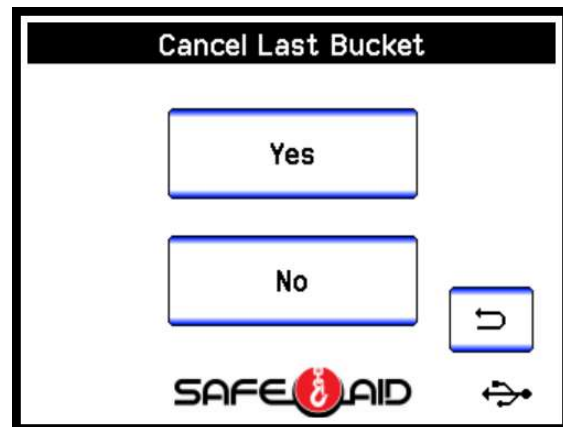
- Left of front-end loader picture – total number of buckets to get to Total Weight
- Right of front-end loader picture – bucket weight – this is the actual load in the bucket. See setting **Bucket Weight** for accurate readings
- Product Pile – Target Weight – this weight reduces as the truck is loaded. See **Cancel Bucket** for accurate loading.
- Truck Weight – Total Weight – the actual weight loaded into the truck – this will increase as the number of loaded buckets increases. See **Cancel Last Bucket** for accurate loading.
- Target Weight – this is the target set at the start of the batch.
- Bucket angle – above the front-end loader image. This is the angle of the arm and bucket and may assist the operator with determining where the trigger and reset points are.
- A  block above the front-end loader picture will be coloured green if the system is ready to capture a bucket. The arm must be raised above the trigger point for the system to capture this value into the data logging.
- Once a bucket is recorded, the block will turn white  The system has recorded a bucket load, and it will need to go past the reset angle set by the installer to reset for capture of the following bucket. This is to ensure that there are no false readings / buckets near the trigger point from lowering and raising the arm. Once the reset angle is reached, the block will then appear green again, ready for capture of the next bucket.
- If the angle of the arm is below 10° or above 80°, the system will not show a live weight to the right of the front-end loader. At these angles there is usually no need to trigger a capture and the system will show **\*-\***
- An angle indication is displayed to the right of the front-end loader graphic for the operator to at a quick glance view the positioning of the bucket. A coloured dot moves within the entire range according to the angle of the bucket. The zones are as follows:
  - **DIGGING ZONE** – 0° to 30° and not a weighing zone
  - **LIFTING ZONE** – Between 31° and 50° approaching the weighing zone
  - **WEIGHING ZONE** – 51° to 65 ° Optimal weighing zone - where the **Trigger Angle** is set
  - **FINAL LIFT ZONE** – 66° and above and not a weighing zone



## Cancel Last Bucket

Once the Truck Weight is close to the Target weight the **Cancel Bucket** option can be used to get as close as possible to the Target weight by following the procedure below:

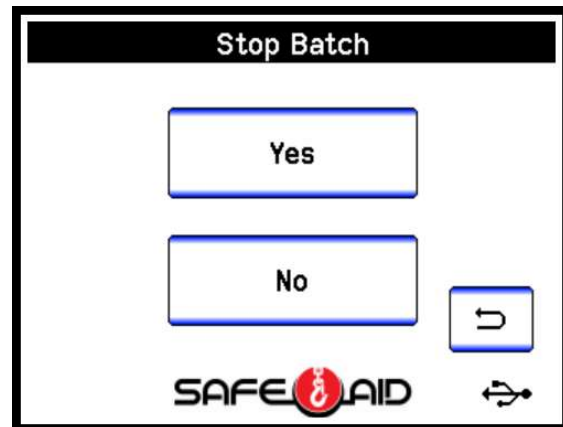
- Take the bucket past the Trigger Angle.
- Press the **Cancel Bucket** button.
- Press **Yes**.
- Empty the approximate amount needed to reach the correct Target Weight.
- Lower bucket below Reset Angle
- Take bucket past Trigger angle.
- Repeat procedure, if necessary, until the Total Weight is equal to or slightly less than the Target Weight.
- Only the last bucket lifted can be cancelled i.e. Cancel Bucket button will not show when the number of buckets is 0 or the last bucket has been cancelled.



## Stop Batch



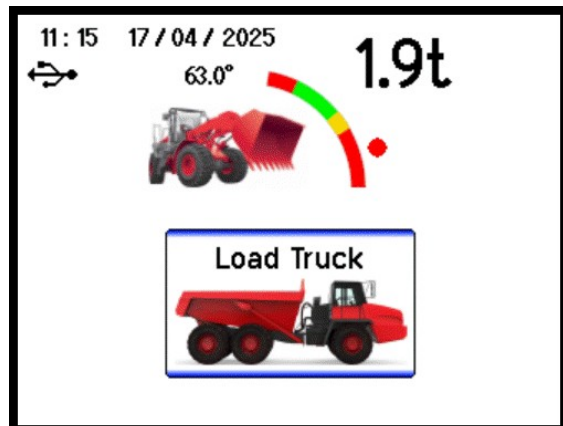
Press the **Truck Picture** once the Target Weight has been reached and the vehicle completely loaded. Press the **Yes** button to stop the batch, the screen will now return to the Load Truck screen.



## Real Time Clock

The TS350 system has an internal real time clock which displays date and time on the main running screen in the top left-hand corner. It is imperative that the date and time are correct as the data logging utilises this when errors are logged.

See Set **Date & Time** to change.

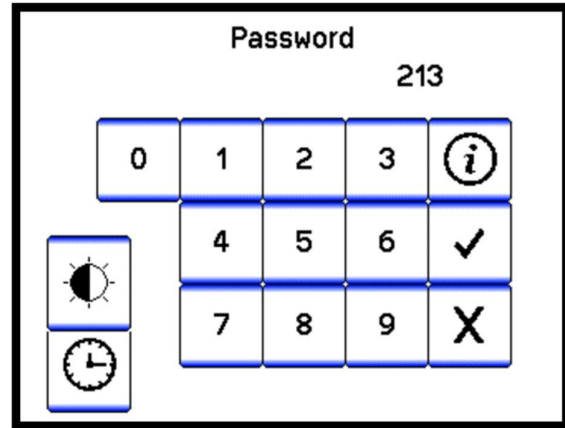



## Set Date & Time

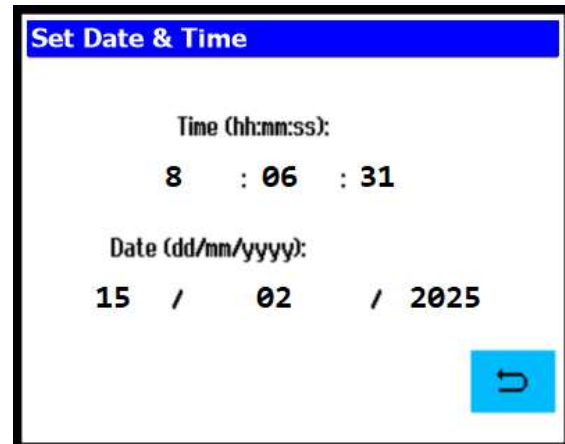
The date and time can be adjusted as required. If the date and time does not save or shows incorrect after setting or powering down the battery for the real time clock may be faulty. Battery replacement must be done in the factory or by a trained technician.

Use the following steps to adjust the date & time:

1. Press the top left-hand corner and the **Password** screen will be displayed.



2. Press the  and the Set Date & Time screen will be displayed. Select the data to be adjusted and set the correct time and date.
3. Time format is 24 Hour Clock hh : mm : ss
4. Date format is dd / mm / yyyy
5. Once the time & date have been adjusted



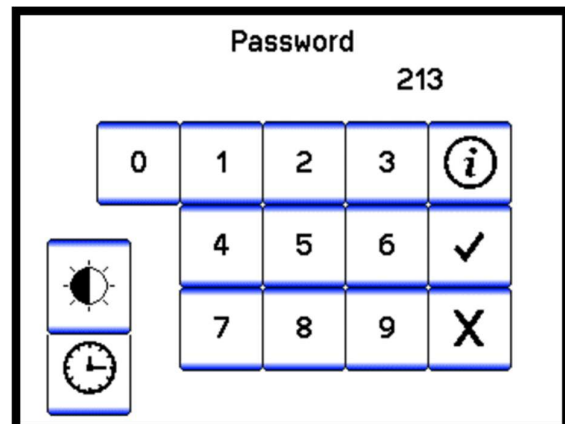
press the  button to return to the operating screen.


## Screen Brightness

The screen backlight can be set as required.


Use the following steps to adjust the screen brightness:

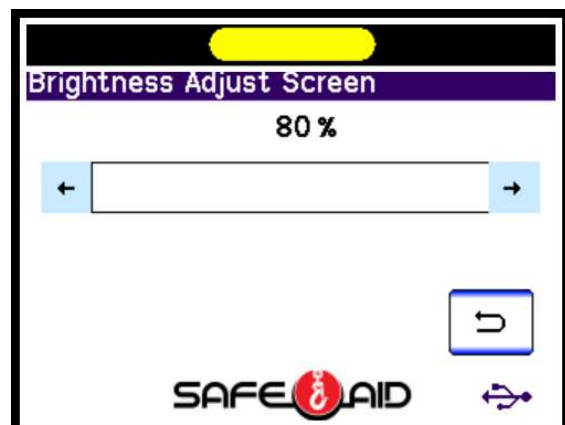
1. Press the top left-hand corner and the **Password** screen will be displayed.



2. Press the  and the Brightness adjust screen will be displayed. Use the slider bar to adjust the screen to the required brightness.

3. Once the brightness has been adjusted press

the  button to return to the operating screen.



## Touch Screen Calibration

*If the screen is not responding correctly to touch, the touch screen may need to be calibrated. Make sure that the Front Facia (Sticker) is in good condition (no dents or damage) as this can affect the touch screen. Replace Front Facia if damaged.*

Switch the TS350 display power off, power up the TS350 while pressing in the middle of the screen.

While the splash screen is on, keep pressing in the centre of the screen for a full five seconds until the touch calibration is activated and loaded. Immediately lift your finger and follow the on-screen instructions.

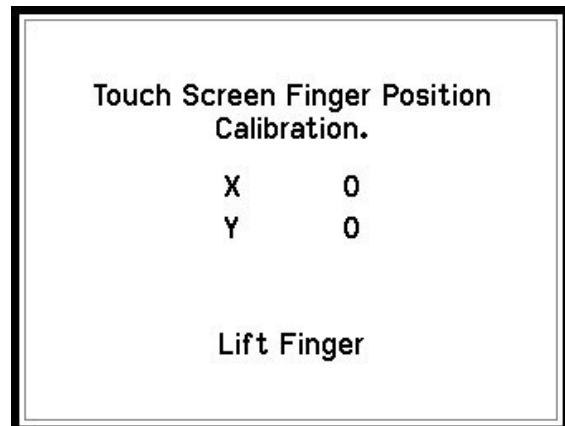
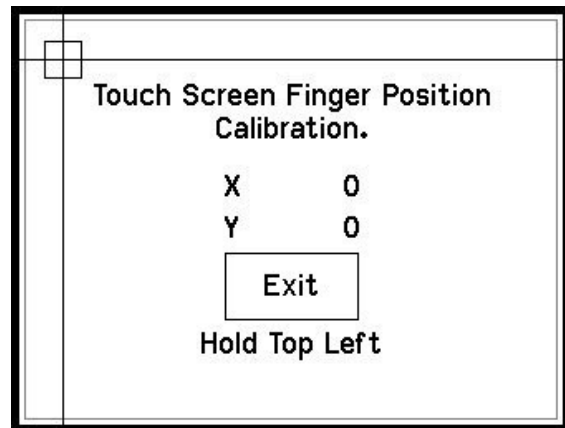
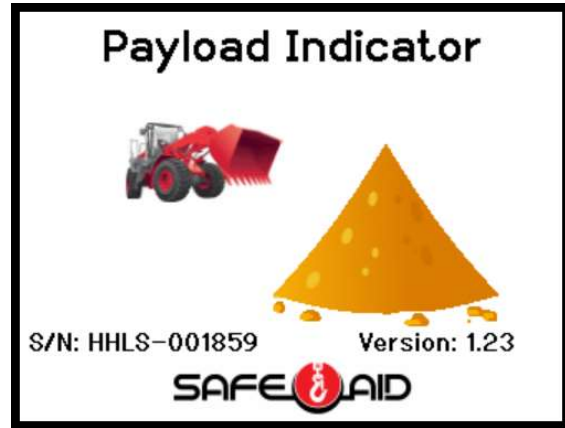
If by accident the calibration screen has been entered, press the **Exit** button without pushing anywhere else on the screen to continue with normal start up procedures.

If the touch screen calibration is required, follow the below procedure:

Press and hold finger where the two lines meet inside the small box at the top left-hand corner. Calibration works fine when using a finger but for better results use a pen taking care not to press too hard or the screen will be damaged.

Hold finger/pen in this area until prompted to lift. Prompts will then be given for three more touch zones resulting in co-ordinates for all four corners of the screen.

Once calibration is complete the software automatically goes to the working screen.



## Fuse Protection

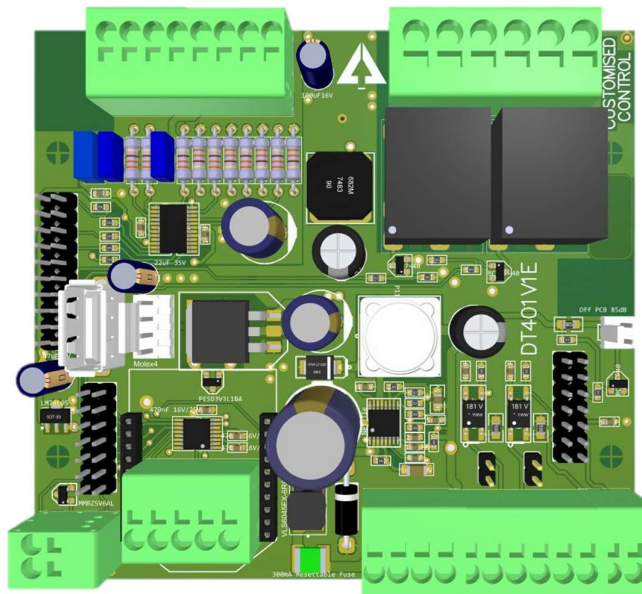
Operating Voltage Range: 10–48 VDC

To protect against overcurrent and short-circuit conditions, the TS350 is equipped with a resettable fuse.

The fuse characteristics are:

<b>TRIP TIME</b>	4 Seconds
<b>HOLD CURRENT</b>	500mA

This resettable fuse automatically restores functionality once the fault condition is cleared, ensuring minimal downtime and enhanced safety.



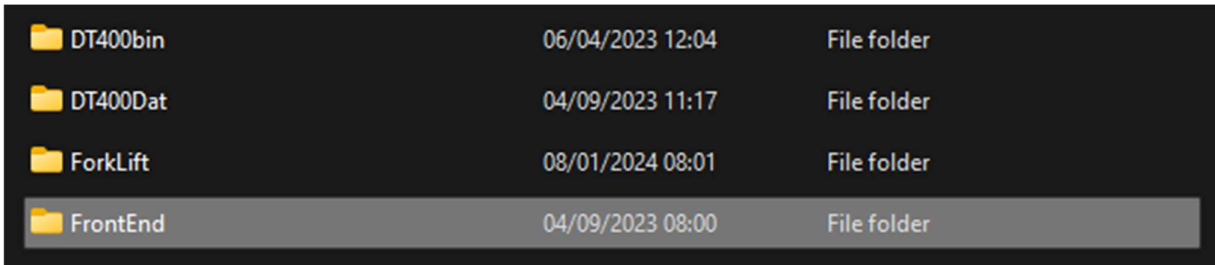
Note: For earlier versions of the PC board, a fixed 2A blade fuse is used instead. Please refer to the appropriate version-specific manual to confirm fuse type and replacement procedures.





## Downloading Logged Files

The logged data from the TS350 display unit is written to the USB flash drive (a batch cannot be started, and no data will be logged without a USB flash drive). Insert the USB flash drive into a PC to allow the data to be managed.

Logged data is saved as DAILY files. The following process will run through the download of the files from the USB flash drive:

Select the Front-End folder.

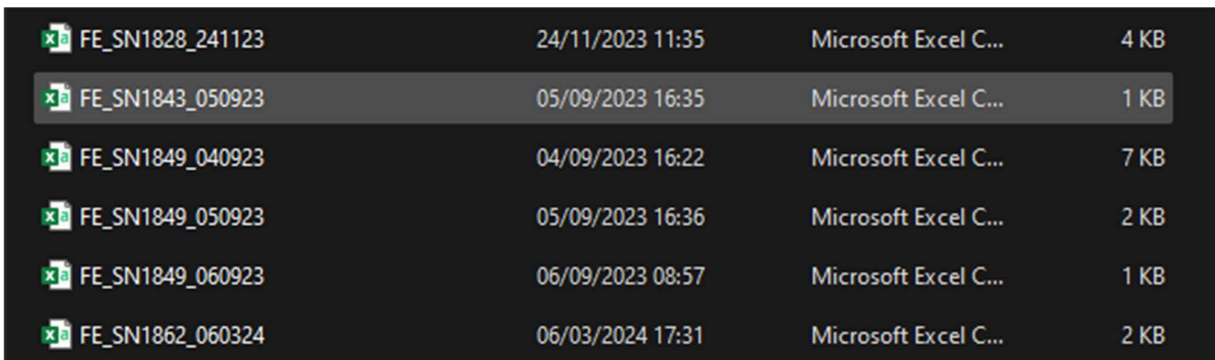








 DT400bin	06/04/2023 12:04	File folder
 DT400Dat	04/09/2023 11:17	File folder
 ForkLift	08/01/2024 08:01	File folder
 FrontEnd	04/09/2023 08:00	File folder

The log file is structured as follows:

- FE – first 2 letters are for Front-End Loader.
- \_SN1843 – TS350 display unit serial number.
- \_050923 – Day, Month & Year the file was created on the TS350 display unit.

Select the required log file.



 FE_SN1828_241123	24/11/2023 11:35	Microsoft Excel C...	4 KB
 FE_SN1843_050923	05/09/2023 16:35	Microsoft Excel C...	1 KB
 FE_SN1849_040923	04/09/2023 16:22	Microsoft Excel C...	7 KB
 FE_SN1849_050923	05/09/2023 16:36	Microsoft Excel C...	2 KB
 FE_SN1849_060923	06/09/2023 08:57	Microsoft Excel C...	1 KB
 FE_SN1862_060324	06/03/2024 17:31	Microsoft Excel C...	2 KB

- Data is stored in .CSV file (comma-separated values) which is a text file that has a specific format allowing data to be saved in a table structured format. This file can be opened with the any compatible program e.g., Excel, Google Sheets or Notepad.