TS350 PAY LOAD INDICATOR

FRONT END LOADER

OPERATORS MANUAL

Version 8 – October 2026



! 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....3
SYSTEM STARTUP....4
BUCKET WEIGHT....4
OPERATING SCREENS....6
ERROR CONDITIONS....6
BUCKET ONLY WEIGHING....7
BATCH WEIGHING....7
TRIGGER ANGLE....7
RESET ANGLE....8
START NEW BATCH....8
MACHINE ID....9
MATERIAL / PRODUCT ID....9
CUSTOMER NAME / ID....9
TARGET WEIGHT....9
RUNNING BATCH....10
CANCEL LAST BUCKET....11
STOP BATCH....11
REAL TIME CLOCK....12
SCREEN BRIGHTNESS....12
SET DATE & TIME....13
TOUCH SCREEN CALIBRATION....14
FUSE PROTECTION....15
DOWNLOADING LOGGED FILES....16

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

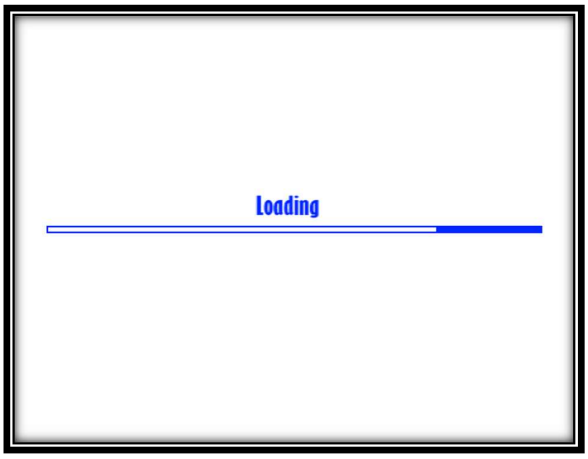
The following is the standard day to day process used for accurate weighing:

1. **Warm up** the **hydraulic fluid** performing 4 – 5 lifts of the arm & bucket.
2. **Zero** the **empty bucket** using the 3 sweep procedure at startup.
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.

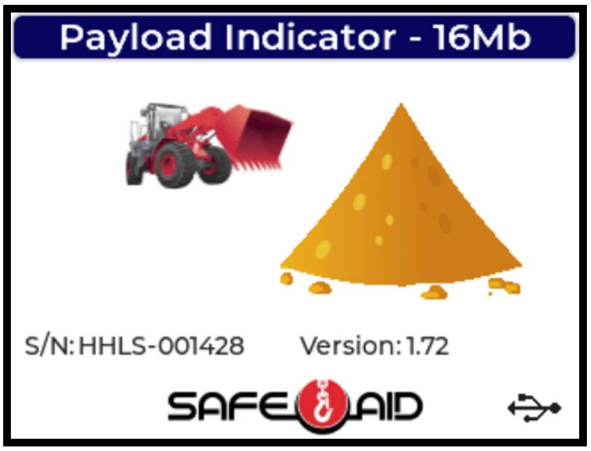
The system will run a CRC (cyclic redundancy check) to make sure that all raw data is correct.

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



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.

On start-up, the system initiates a **three-sweep zeroing procedure** to calibrate the system against the empty bucket weight, ensuring accurate payload measurements. Simply raise and lower the empty bucket through three complete sweeps from the preset reset angle to the trigger angle, following the on-screen instructions.

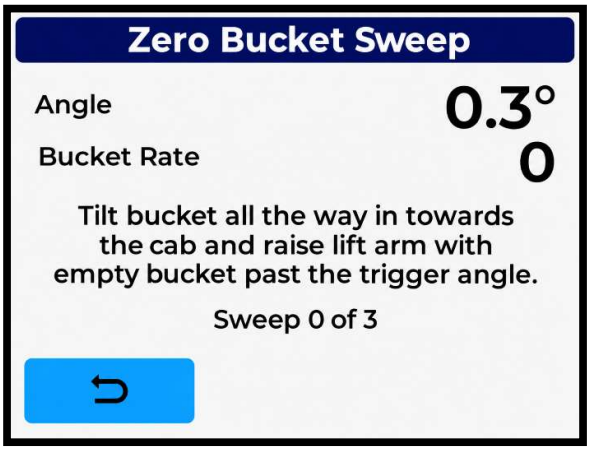
If the displayed bucket weight is not zero follow the procedure below:

- **Lower Arm to below Reset Angle**
- **Raise Arm slowly to Trigger Angle**
- **Repeat three times**

The  may be pressed at any stage to skip the zeroing procedure and proceed directly to normal operation.

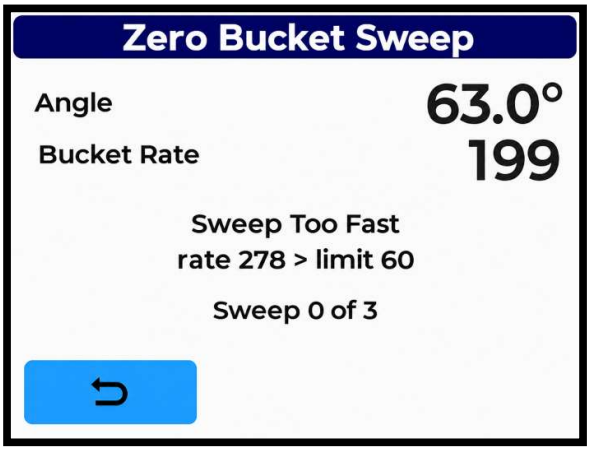
Raising the Bucket

Tilt the empty bucket fully towards the cab and raise the lift arm past the trigger angle to perform the zeroing sweep.



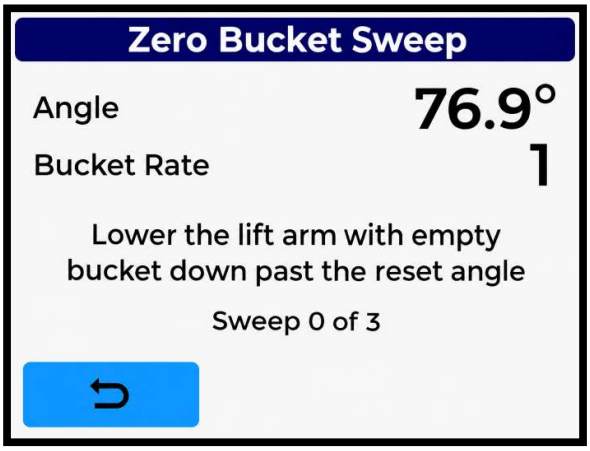
Sweep Too Fast

If the bucket is raised too quickly, the system displays a warning and will prompt to repeat the sweep at a slower, controlled speed to ensure accurate calibration.



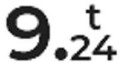
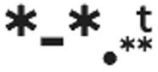
Lowering the Bucket

Lower the lift arm with the empty bucket past the specified reset angle to prepare for the next sweep.



Single-Sweep Bucket Zero

A single-sweep bucket zero can be performed at any time while the system is powered on.

Simply tap the **actual load value**  **OR**  displayed to the right of the front-end loader image on either the **Load Only** or **Batch** screen to initiate the zeroing procedure and follow the on screen prompts.

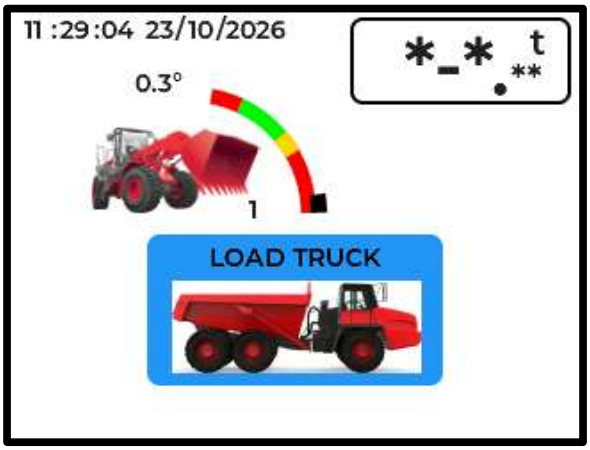
OPERATING SCREENS

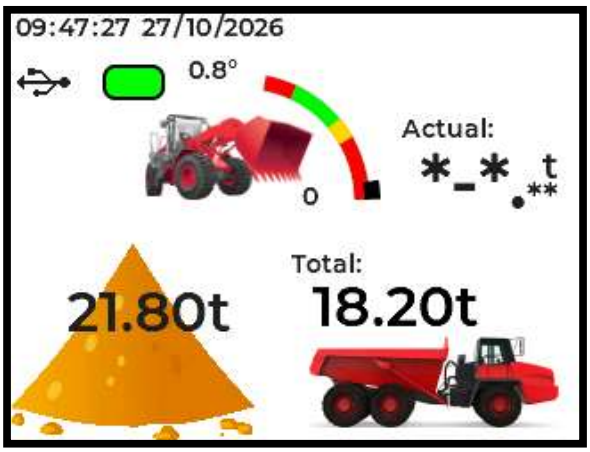
The system starts in either of the following screens:

- 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



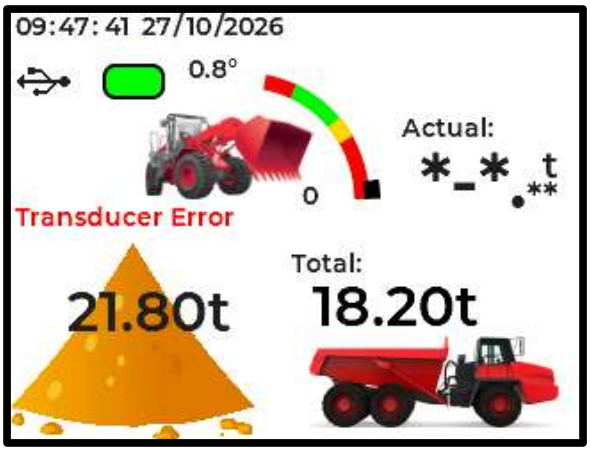


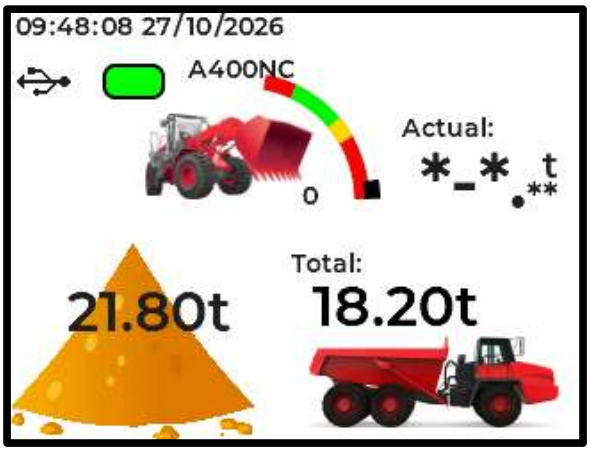
ERROR CONDITIONS

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.

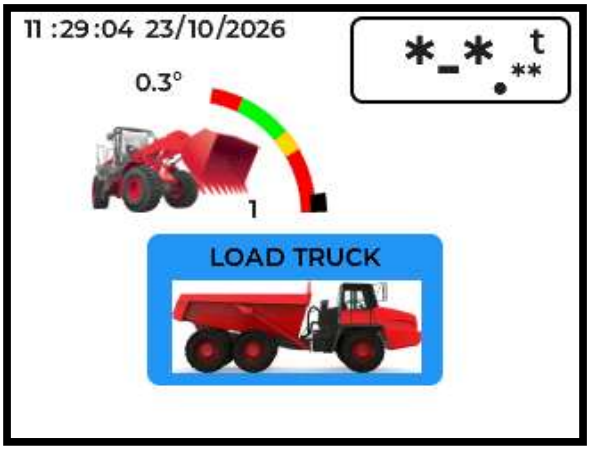
Close Bucket – This may be activated or disabled depending on the installation. A sensor / switch monitors the position of the bucket and if not tilted (towards the operating cab), this may cause an error message to be displayed "**Close Bucket**". If this message appears, tilt the bucket inwards and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





BUCKET ONLY WEIGHING

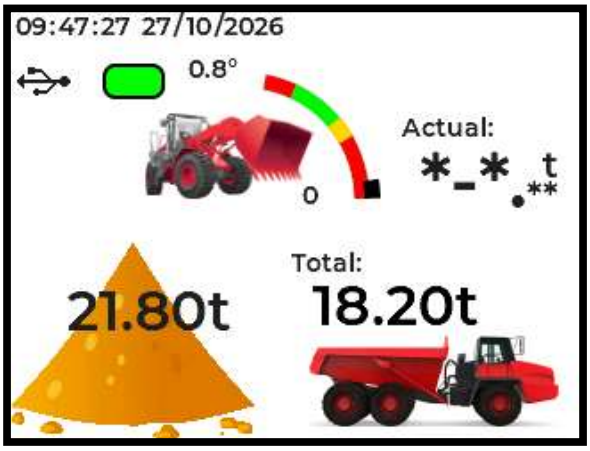
Bucket only weighing can be done if no batch has been started. The bucket weight will be shown but **no totalising or batching is done** just the load in bucket weight is displayed. No data logging / reporting is logged.



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 Weights
- Machine ID
- Material / Product ID
- Customer ID



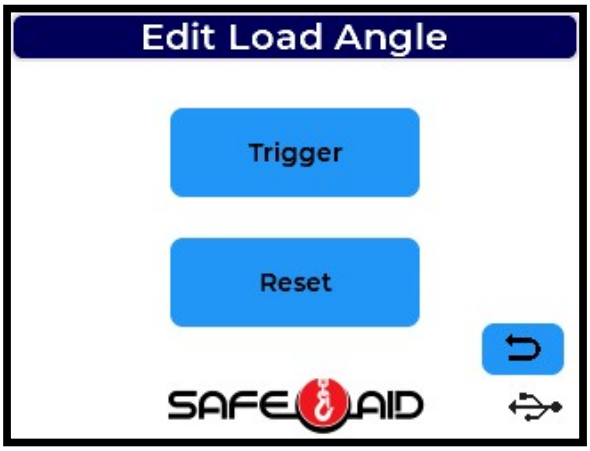
TRIGGER ANGLE

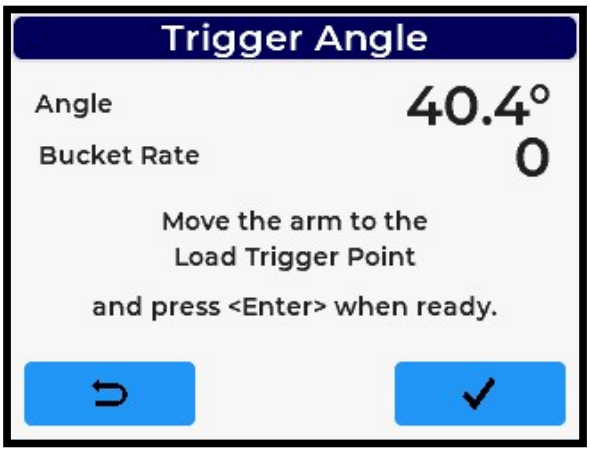
Batch weighing must be **Stopped** to change the trigger angle.

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 heights and a new point is required, repeat the process.

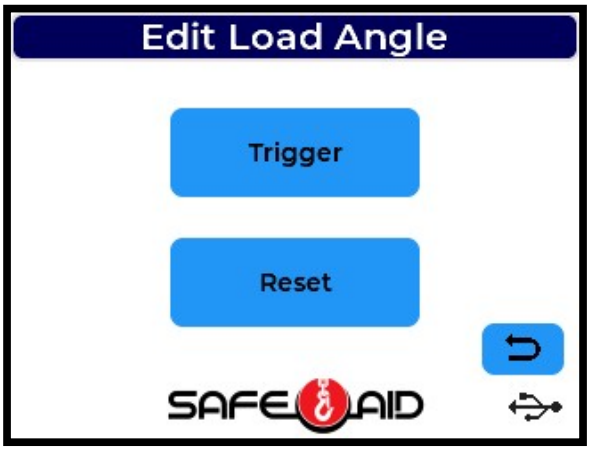




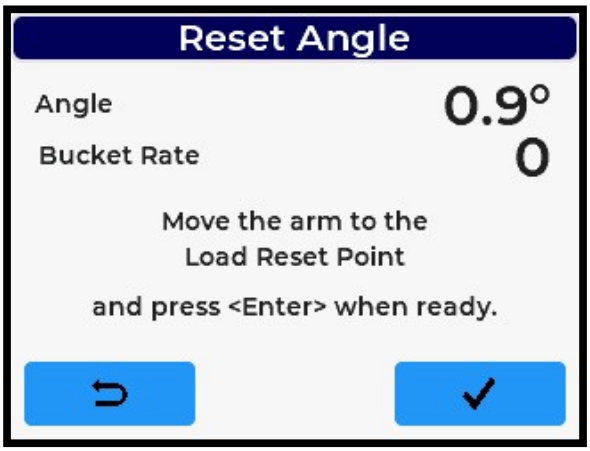
RESET ANGLE

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 heights and a new point is required, repeat the process.

START 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 to batch or **No** to return to the Load only screen.



MACHINE ID

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.



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.



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.



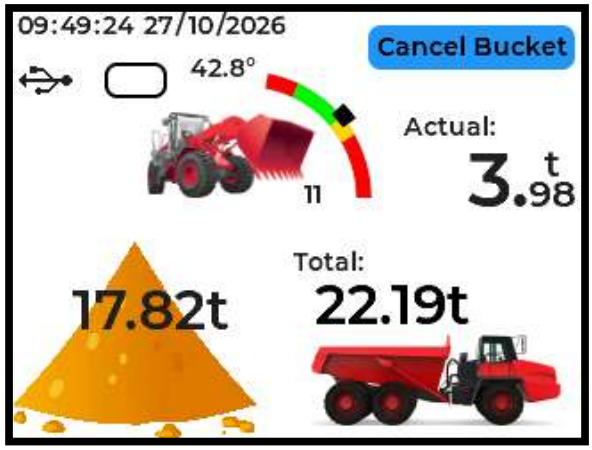
TARGET WEIGHT

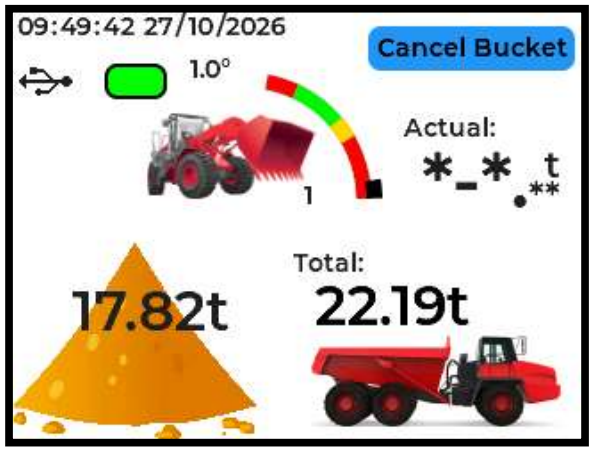
Use the number keypad to type in the target weight required for the vehicle. This total is very important as all calculations are based on this this total. Careful attention should be paid when entering. If the same truck is being loaded the display will keep the same data until new data is entered.



RUNNING BATCH

Start loading the vehicle the display will show the following:

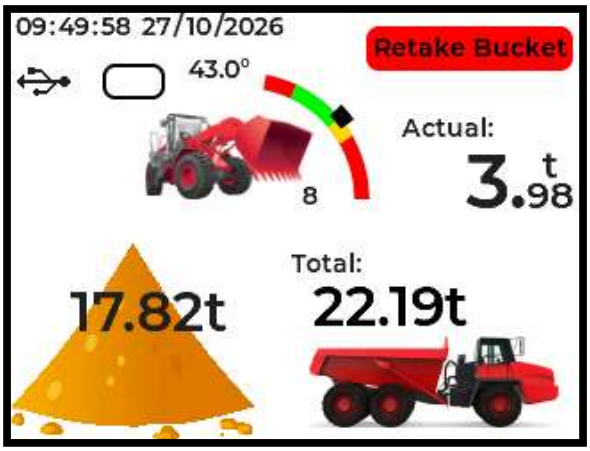




- Right of front-end loader picture – **Actual** – this is the actual load in the bucket. See setting **Bucket Weight** for accurate readings
- **Product Pile** – this weight reduces as the truck is loaded. See **Cancel Bucket** for accurate loading.
- **Total** – the actual weight loaded into the truck – this will increase (accumulate) as the number of loaded buckets increases. See **Cancel Last Bucket** for accurate loading.
- **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 30° or above 67°, 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 *_*.** t
- 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 29° and not a weighing zone
    - **LIFTING ZONE** – Between 30° and 39° approaching the weighing zone
    - **WEIGHING ZONE** – 40° to 64 ° Optimal weighing zone - where the **Trigger Angle** is set
    - **FINAL LIFT ZONE** – 6° and above and not a weighing zone

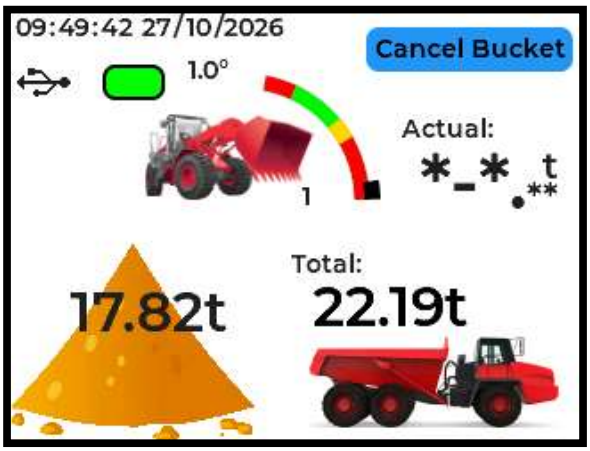
- The TS350 monitors the speed of the boom / arm elevation and for accurate loads this speed should not exceed a set speed (set by installer). If this speed is exceeded, the system **will not capture the load** and a warning message in RED in the top right corner will appear ReTake Bucket The arm will need to be lowered to below the Reset Angle and raised again at an acceptable speed to capture the load.

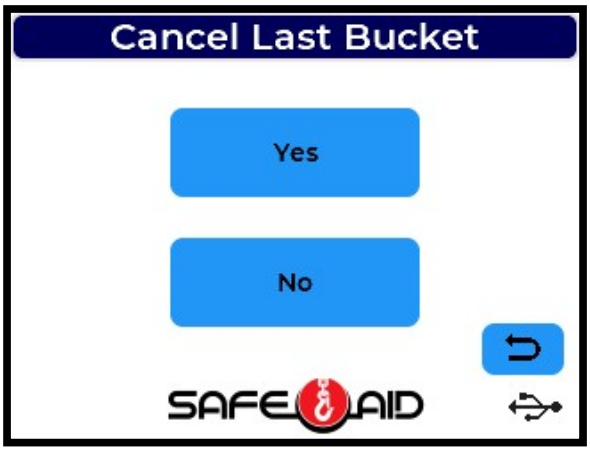


CANCEL LAST BUCKET

Once the Total 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** to cancel or **No** not to cancel.
- Empty the approximate amount needed to reach the remaining pile 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



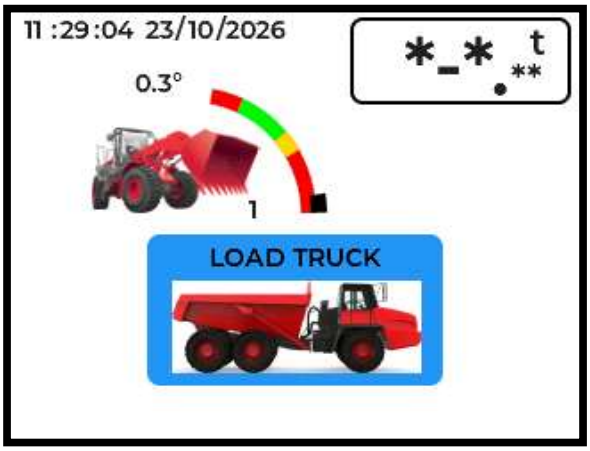


STOP BATCH

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.



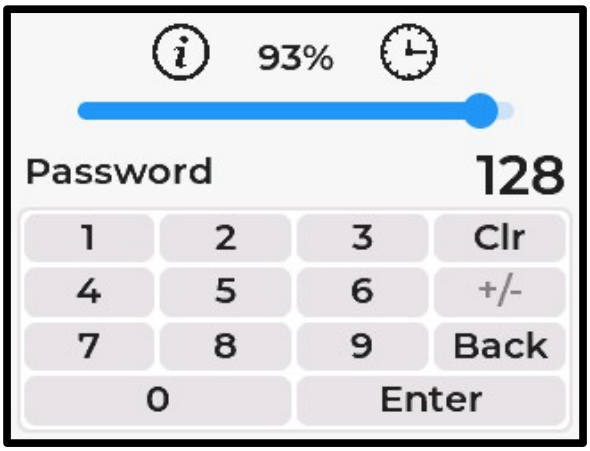
REAL TIME CLOCK



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.

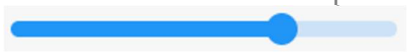
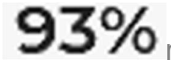
See Set **Date & Time** to change.

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. Slide the slider bar to the required brightness. 
   The 

represents the brightness set where 0% is the lowest and 100% is the highest brightness.
3. Once adjusted press the 

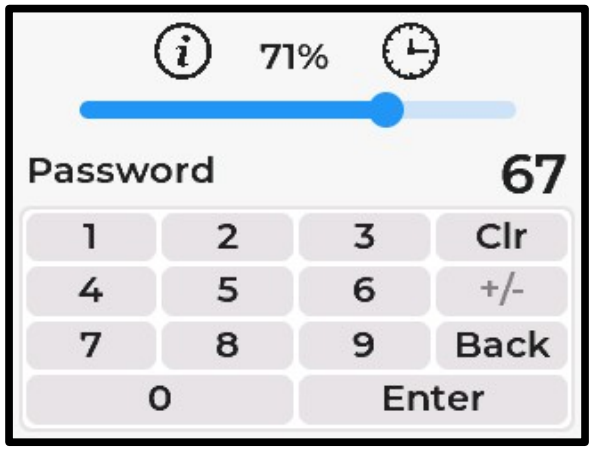
button to return to the operating screen.

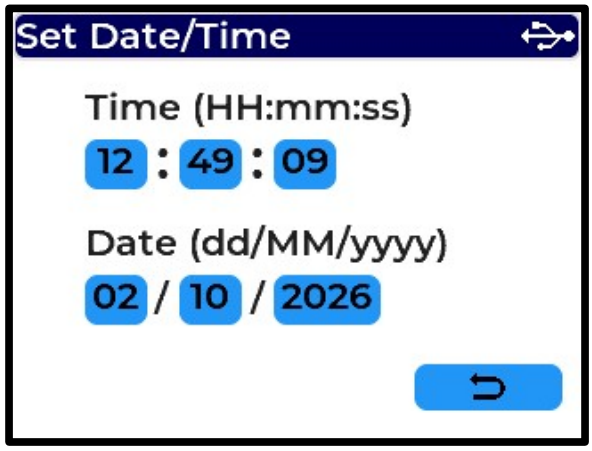
SET DATE & TIME

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.

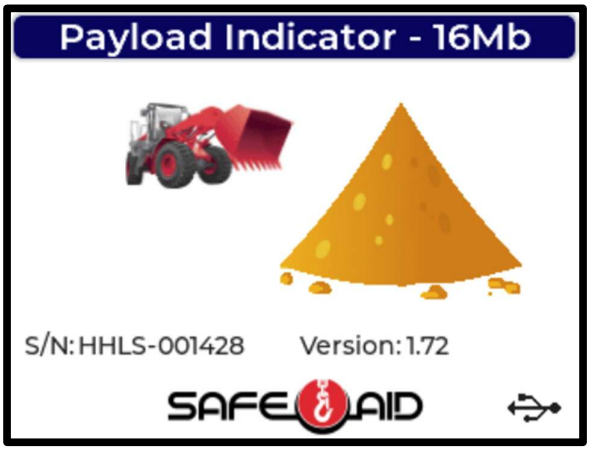




TOUCH SCREEN CALIBRATION

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.

Power up the TS350 display.



As soon as the splash screen appears, press 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 the calibration screen has been entered by accident and touch calibration is not necessary, 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.

TS350 Front Facia's are available from the manufacturer at a nominal charge and should be changed as part of a maintenance schedule.

FUSE PROTECTION

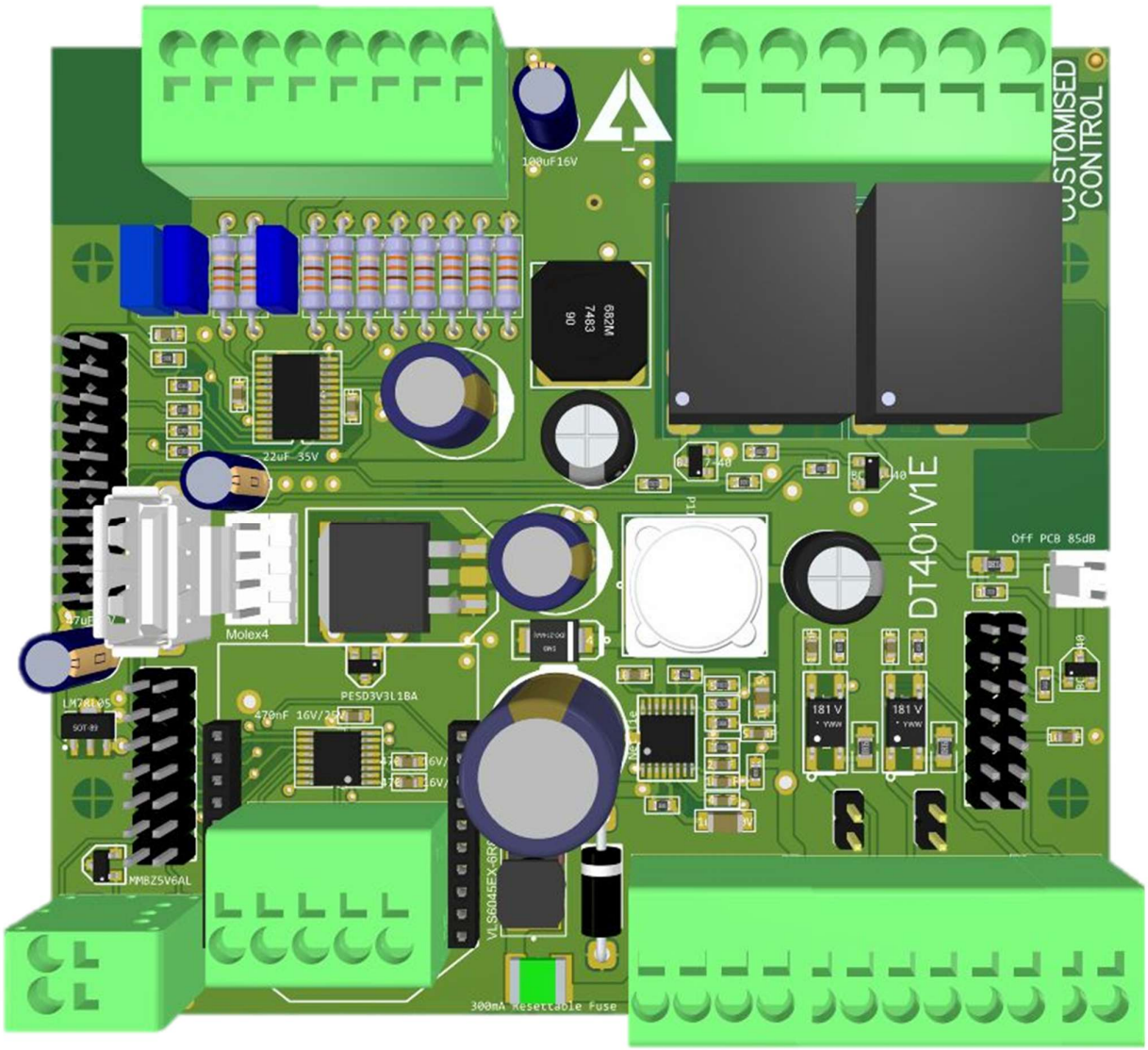
Operating Voltage Range: 10–48 VDC

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

The fuse characteristics are:

TRIP TIME	4 Seconds
HOLD CURRENT	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.

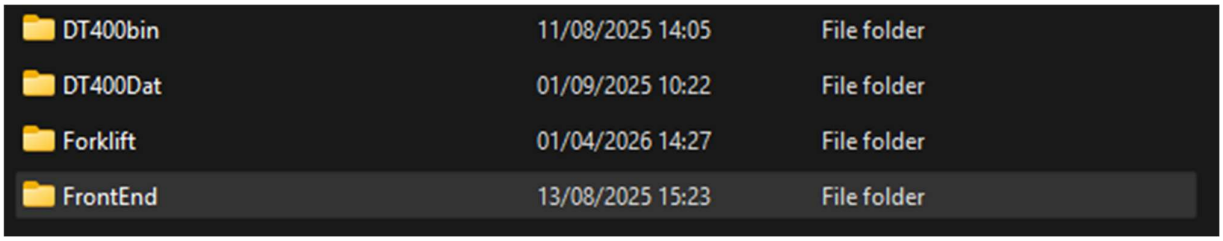
DOWNLOADING LOGGED FILES

The logged data from the TS350 display unit is transferred from the TS350 internal memory to the USB flash drive and then inserted into a PC manually to allow the data to be managed. The TS350 may hold a maximum of 4000 records so ensure downloads are done on a regular basis. Logged data is saved as downloaded date files. The following process will run through the download of the files from the USB flash drive:

1. Insert a USB flash drive into the USB port at the rear of the TS350 display.
2. Ensure that the USB flash drive uses a FAT32 file system (usually default / standard unless changed) and not NTFS or EXFAT. If not, reformat the USB drive to a FAT32 file system as data may not be downloaded correctly.
3. The system will prompt the user to **Download Logs.**
4. Select **Yes** to download.
5. The system will then transfer the data to the USB flash drive. A screen with **Saving Logging** will appear if successful.
6. Do not remove the USB flash drive while the system is saving to the device. Only once the loading bar is finished and the user has waited for 3 to 4 seconds is it safe to remove the USB flash drive. If removed while saving, data may be lost.
7. Remove the USB flash drive and insert into a PC.
8. Select the applicable Drive (Removable Device) on the PC.
9. Select the **FrontEnd** folder.



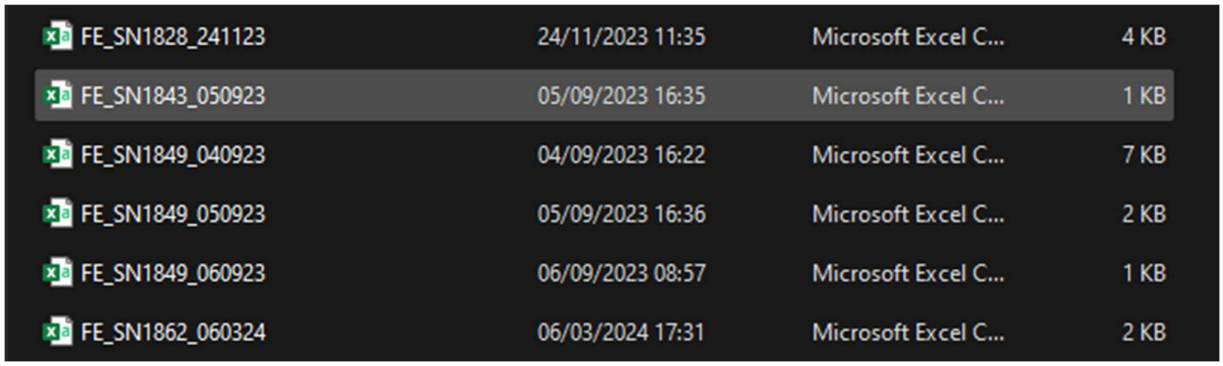




The log file is structured as follows:

- FE – first 2 letters are for Front-End Loader.
- _SN1843 – TS350 display unit serial number.
- _050923 – Day, Month & Year the file was requested (USB inserted and logs downloaded) on the TS350 display unit.

10. Select the required log file.



- 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.
- The most recent records / batches are printed at the top of the spreadsheet.
- If a file/s are removed / deleted from the USB flash drive, the **data will be deleted permanently**.
- Should the data need to be recovered, the installer should be contacted.

