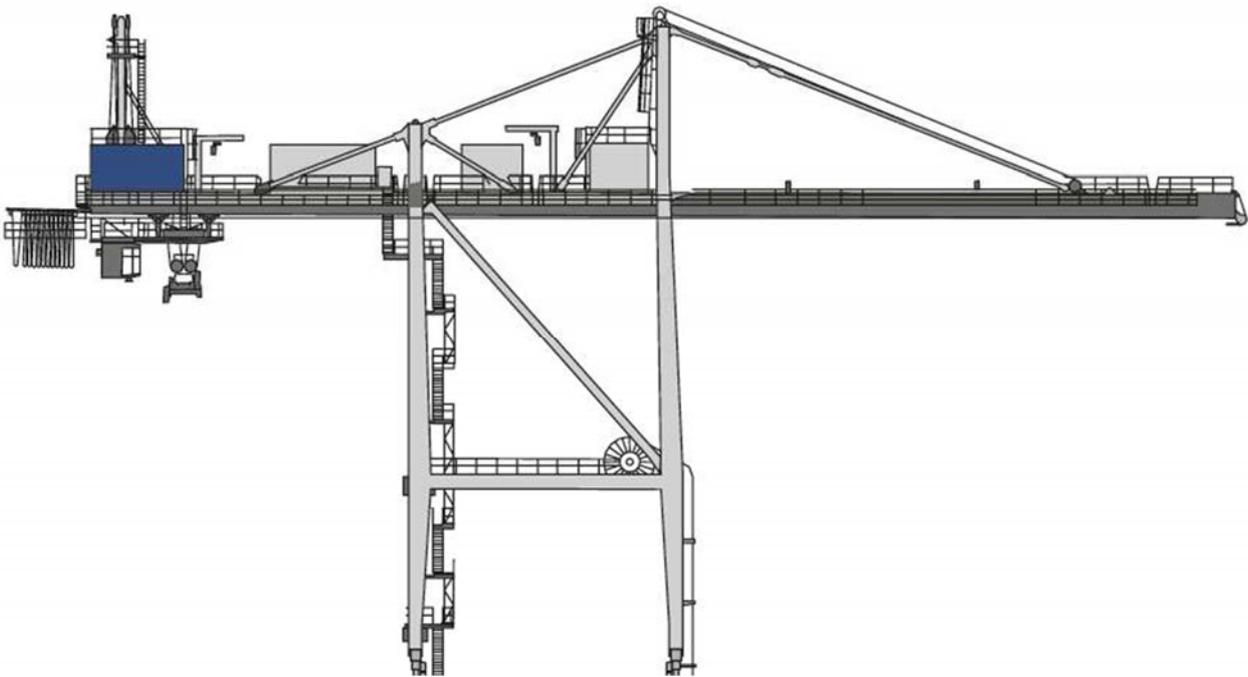




TS7000

STS CRANE OPERATORS MANUAL



VERSION I
9/7/2018



THE PURPOSE OF THIS MANUAL IS TO PROVIDE THE CUSTOMER 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.

THE SAFE-AID TS7000 (RATED CAPACITY INDICATOR (RCI)/LOAD MOMENT INDICATOR (LMI)) IS ONLY TO BE REGARDED AS AN AID TO THE OPERATOR. WHEN THE PARAMETERS ARE SET CORRECTLY, THE INDICATOR WILL WARN THE CRANE OPERATOR OF AN APPROACHING OVERLOAD CONDITION OR A CONDITION THAT COULD CAUSE DAMAGE TO EQUIPMENT, PROPERTY, AND/OR INJURY TO THE OPERATOR OR THE SITE WORKERS IN THE VICINITY OF THE CRANE AND ITS LOAD.

THIS SYSTEM UNDER NO CIRCUMSTANCES MUST BE USED AS A SUBSTITUTE FOR THE GOOD JUDGEMENT OF A CRANE OPERATOR WHEN CARRYING OUT APPROVED CRANE-OPERATING PROCEDURES, THEREFORE THE RESPONSIBILITY FOR THE SAFE OPERATION OF THE CRANE LIES WITH THE CRANE OPERATOR. THE SYSTEM WILL NOT NECESSARILY PREVENT DAMAGE DUE TO OVERLOADING AND RELATED CAUSES, IF NOT SET PROPERLY.

BEFORE OPERATING A CRANE EQUIPPED WITH A SAFE-AID TS7000 RCI THE OPERATOR MUST READ THE INFORMATION IN THIS MANUAL CAREFULLY. CORRECT FUCTIONING 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 CRANE.

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SYSTEM USE – FIGURE 1

The TS7000 unit is designed with ease of operation in mind. The crane configuration is selected and confirmed by the operator before the system goes into its operating/monitoring screen requiring no further input from the operator unless the crane configuration is changed. No inputs to the system are required by the operator but the touch screen can be used for the buzzer override function and momentary bypass. 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*).

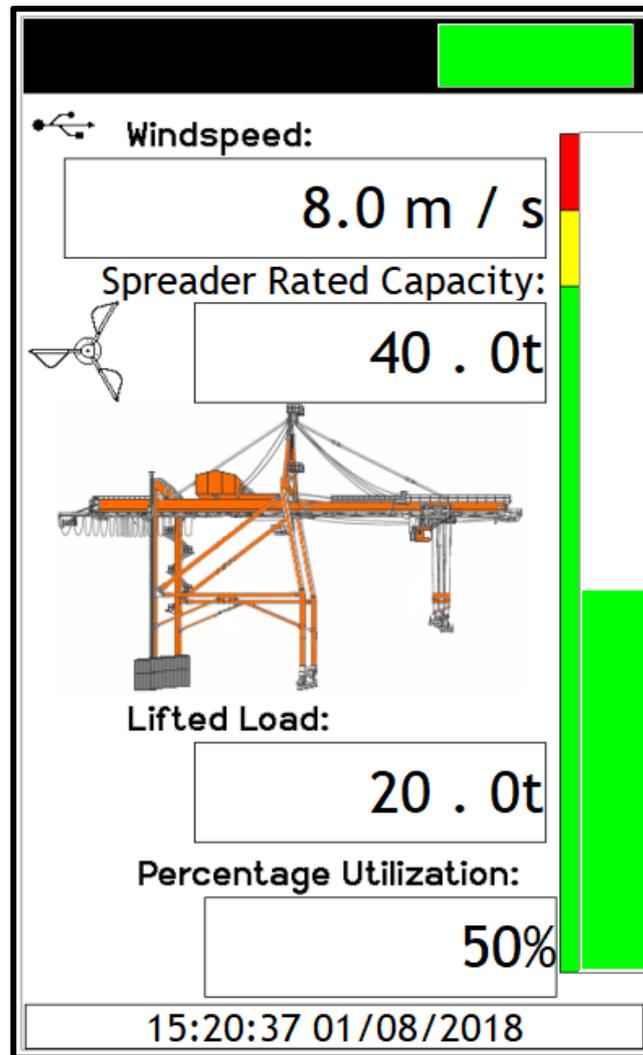


Figure 1

SYSTEM STARTUP- FIGURE 2 & 3

The TS7000 display (LMI) will automatically come on when the crane is powered up, the buzzer will sound once then 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.

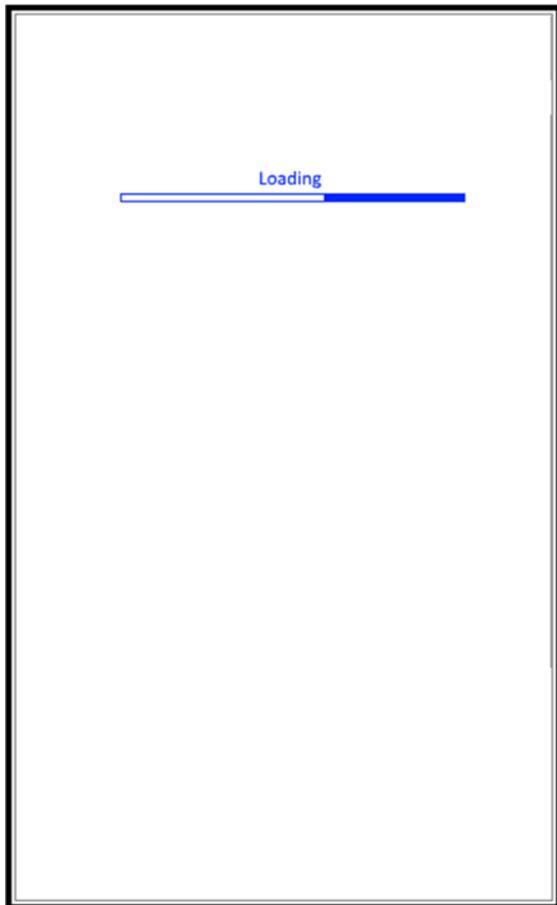


Figure 2

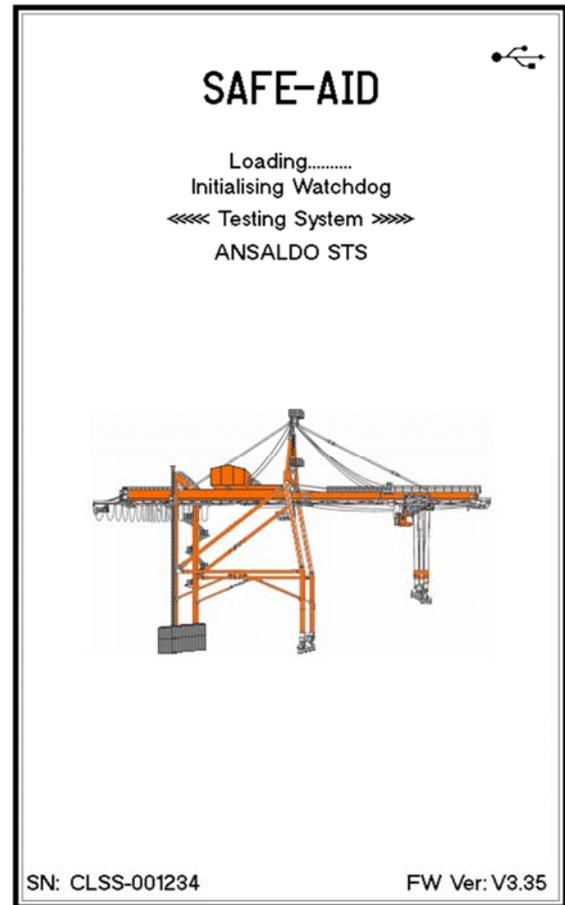


Figure 3

CRANE CONFIGURATION SELECTION

The system will now run through a series of selections to establish the current crane configuration. These selections are setup by the crane manufacturer and correspond to the relevant load chart and may not be displayed or in the same order as laid out in the manual.



Use the back button to start the complete selection from the beginning at any time.

Some manufacturers make these selections with a selector switch so ensure the crane operators manual is used in conjunction with this manual.

The correct selection of the configuration is imperative as this determines the correct rated capacities and work areas. If selected incorrectly, a higher rated capacity than allowed could be selected for that crane configuration, this is very dangerous as it can cause the boom to bend / break or the crane to tip / fall over.

OPERATING SCREEN - FIGURE 4

All the crane and system information can be viewed from here including all the parameters selected from power up.

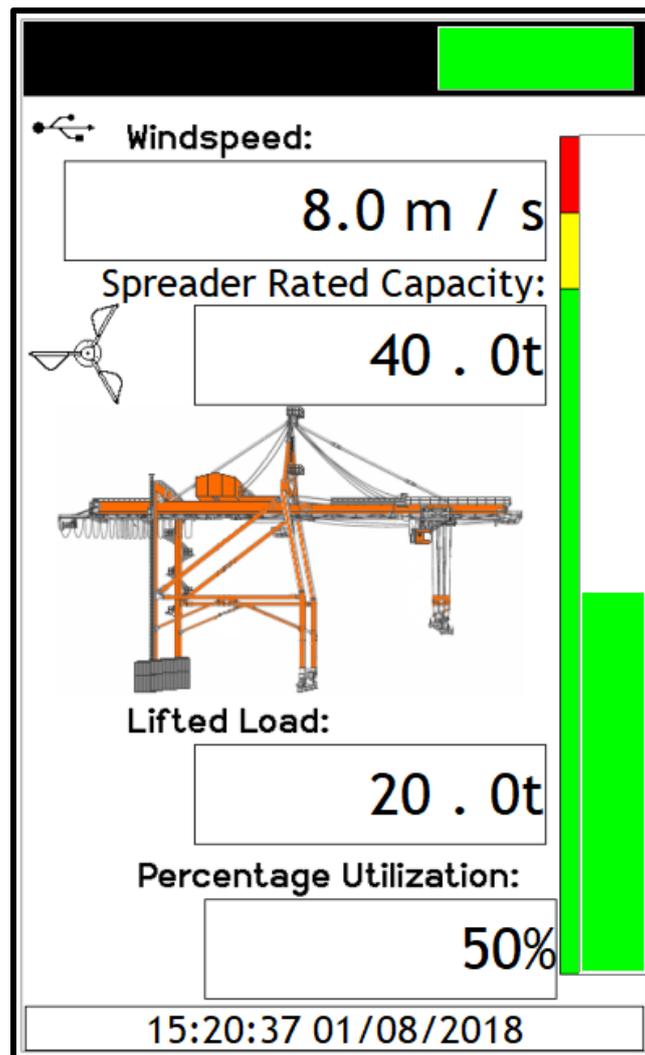


Figure 4

In operating mode, you can see all the current parameters of the crane.

Lifted Load:

20 . 0t

Lifted Load: This is the load on the hook or spreader, if the green light and the load are flashing it is a tare load (the tare has been pressed).

Hook Rated Capacity:

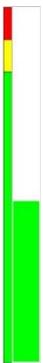
50 . 0t

Rated Capacity: This is the load allowed to be picked up with the selected configuration.

Percentage Utilization:

50%

Utilisation: Percentage utilisation is the percentage of rated load used by the current lifted load.



Utilisation Bar: The percentage utilisation is also displayed graphically by a bar graph, going from green (0% - 89%), then amber (90% - 99%) and finally red (100% and above) increasing incrementally with the percentage utilisation.

15:20:37 01/08/2018

Date & Time: This is the current date and time.

8.0 m / s

Wind Speed: This is the current windspeed (live value) in the units of measure selected.

ERROR MESSAGES - FIGURE 5 AND TABLE #1

The TS7000 will sound a buzzer and the green block will be replaced by an orange or red block at the top of the screen if any error occurs on the system. These errors are displayed at the bottom of the screen as either an error code only or the error description with the error code e.g. Overload E005 where program selection is normally displayed. If more than one error occurs the errors will scroll on the bottom until rectified.

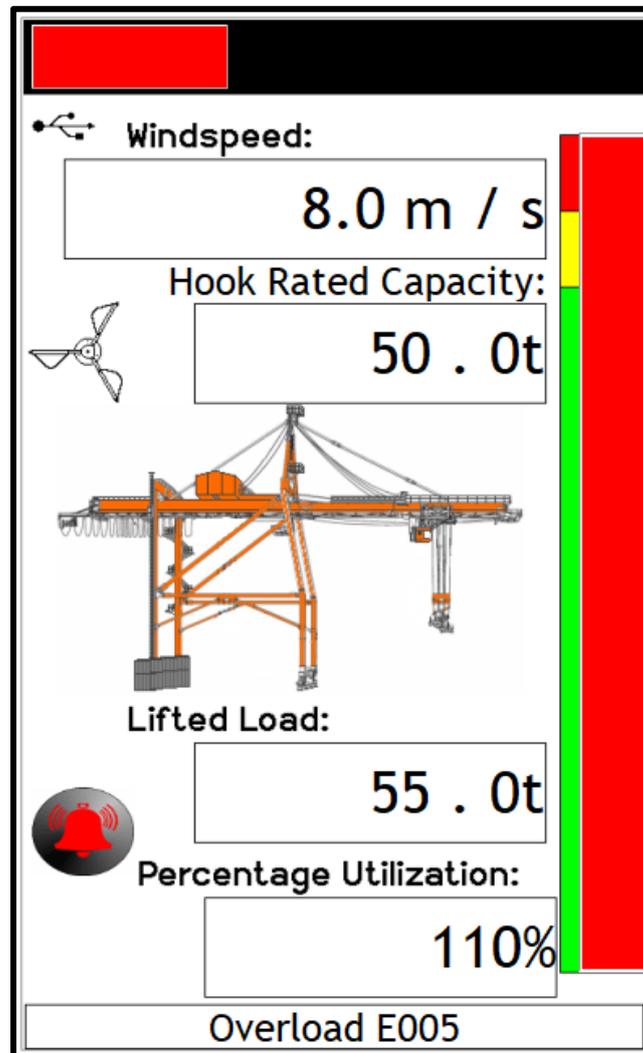


Figure 5

For all the errors, we have given indication of the problem and the common solutions, these can be done by the operator or an individual who has some basic crane knowledge. If the given solution does not work, please contact the original installer or someone from our service network where we can try and help telephonically or send a technician to repair the system.

SAFE-AID TS7000 SYSTEM ERROR TABLE – TABLE #1

CODE	SCREEN DISPLAY	INDICATION	OPERATOR SOLUTION
E004	90% Overload	The lifted load is greater than or equal to 90% of the rated capacity	Move load into safe working position - winch down, boom up or retract boom.
E005	Overload	The lifted load is greater than or equal to 100% of the rated capacity	Move load into safe working position - winch down, boom up or retract boom.
E027	Main A400 No Coms	No communication between main angle board and motherboard/display.	Call installer or service technician.
E028	Aux A400 No Coms	No communication between auxiliary angle board and motherboard/display.	Call installer or service technician.
E029	M400 No Coms	No communication between mother board and display.	Call installer or service technician.
E046	Dump Open Circuit	Open circuit on the Main Dump Output.	Call installer or service technician.
E053	No Dump Supply Main	No supply (power or ground) on the selected dump supply.	Check 5A dump fuse.
E054	Keyswitch Override – High Side	Override Key has been turned to the override position - key cannot be removed from the switch	Turn override key to position where key can be removed.
E055	Keyswitch Override – Low side	Override Key has been turned to the override position - key cannot be removed from the switch	Turn override key to position where key can be removed.
E058	Maximum Windspeed	Maximum wind speed limit specified by the manufacturer has been reached.	Check manufacturers limit has been set correctly.

WORKING OPERATIONS

As an operator, there are **FIVE** different areas/places on the operating screen which can be pressed to initiate a function.



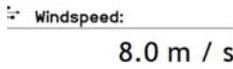
1. **Configuration selection** is the crane graphic on the screen. If at any given time, the current configuration needs to be changed, press on the crane graphic and this will return to the first selection as if powering up for the first time. For example, if working on hook and now spreader, immediately change the configuration to spreader the cranes rated capacities and limits will be different. If a switch is used this functionality is disabled.



2. **The buzzer override** which is in the **bottom left** of the screen; buzzer override will only be displayed 5 seconds after an error condition occurs. When the buzzer override is pressed, the AMBER BLOCK will flash intermittently, and a red cross will be placed through the picture of the buzzer and the buzzer will shut off.



The buzzer override is needed for each alarm condition i.e. if one error has been overridden and another occurs the buzzer will sound again.



3. **Wind Speed** – Press on the wind speed block to enter the wind speed setup (see Wind Speed Setup).



4. **The momentary override** which is the utilisation bar graph on the screen. By holding your finger anywhere in this area, the dump solenoids (lever cut-off) can be overridden momentarily (while pushing on the screen in that area).

Note: This function can only be used if activated by the installer.

5. **Password Access** - This is accessed by pressing the top left-hand corner. Once pressed a password screen will be displayed, enter the relevant password to access the required menu. To exit and return to the operator's screen press **Enter** button. Screen Brightness access is accessed from this menu, see **Screen Brightness**.

INDICATING STATUS LIGHTS - DUMP OUTPUT (LEVER CUT-OFF) - TABLE # 2

There are **Three BLOCKS** (RED, YELLOW & GREEN) that are illuminated like a traffic robot situated on the top of the display screen.



These BLOCKS are illuminated depending on the working state and error conditions. These BLOCKS are a basic way of checking the LMI.

The following chart gives the BLOCK status, buzzer status as well as the status of the DUMP (Lever Cut-off) i.e. DUMP ON the crane will cut-out and DUMP OFF the crane is able to work. To rectify or check the error, please check the error message chart (Table 1) on page 14 & 15.

The GREEN BLOCK will be permanently on when the system is in the correct working condition i.e. no errors

CODE	SCREEN DISPLAY	BLOCK STATUS	DUMP STATUS	BUZZER STATUS
E002	Anti-2-Block	RED	ON	ON
E004	90% Overload	YELLOW	OFF	INTERMITTENT
E005	Overload	RED	ON	ON
E027	Main A400 No Coms	RED	ON	ON
E028	Aux A400 No Coms	RED	ON	ON
E029	M400 No Coms	RED	ON	ON
E038	Anti-2-Block Short Circuit	RED	ON	ON
E045	Main Dump Short Circuit	RED	ON	ON
E046	Main Dump Open Circuit	RED	ON	ON
E053	No Dump Supply	RED	ON	ON
E054	Keyswitch Override – High Side	RED	ON	ON
E055	Keyswitch Override – Low side	RED	ON	ON
E058	Maximum Windspeed	RED	OFF	ON

NOTE:

- The **YELLOW BLOCK** will flash when buzzer override is activated, and if a new error occurs the buzzer will be reactivated and must be overridden again.

TOUCH SCREEN CALIBRATION – FIGURES 6, 7 & 8

If the touch screen is not responding correctly to touch the touch screen may need to be calibrated.

Switch the TS7000 system power off then power up the TS7000 and wait for the splash screen (Figure 6) to appear.

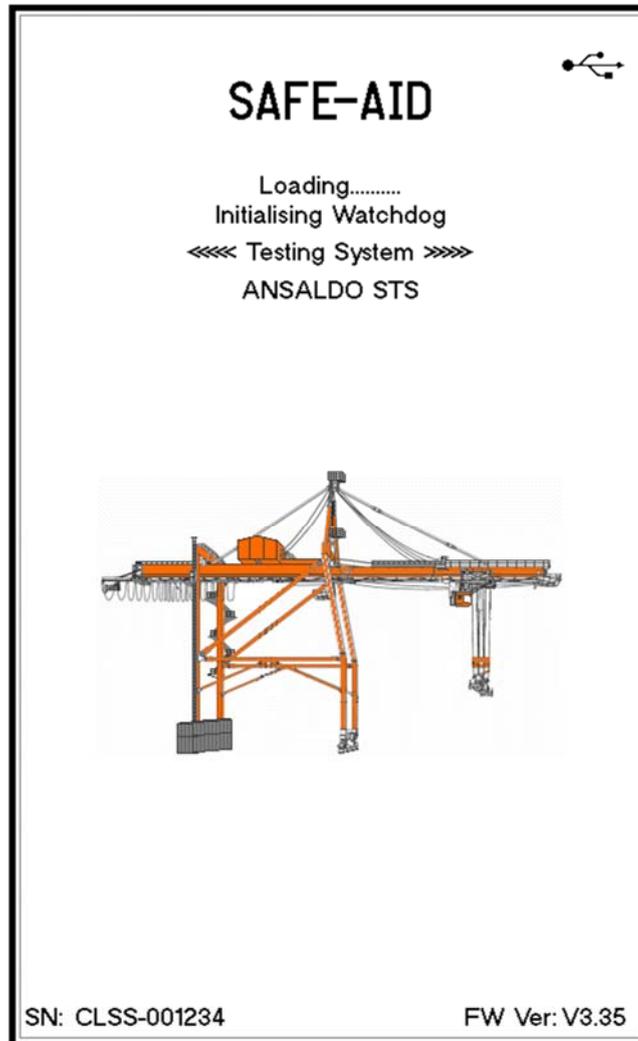


Figure 6

While the splash screen is on, press and hold the screen for five full seconds in the centre until the touch calibration is activated and loaded (Figure 7).

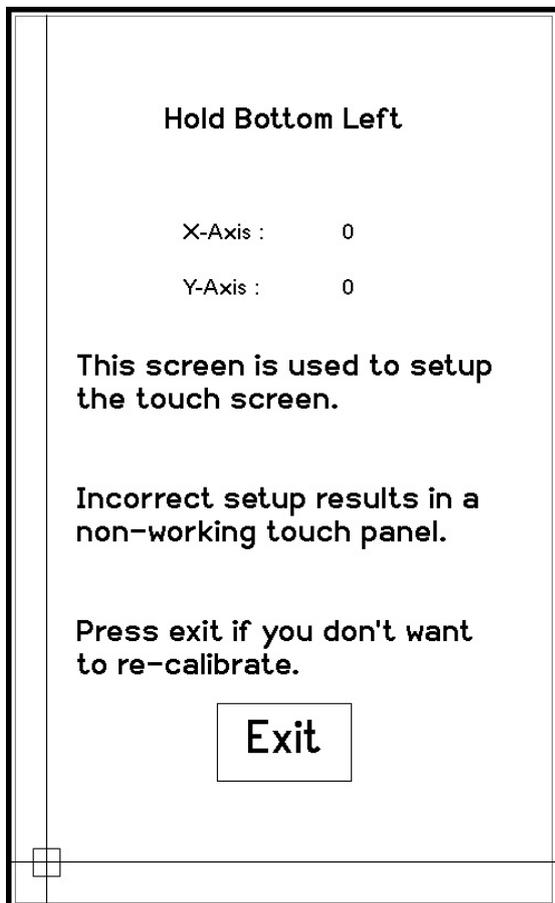


Figure 7

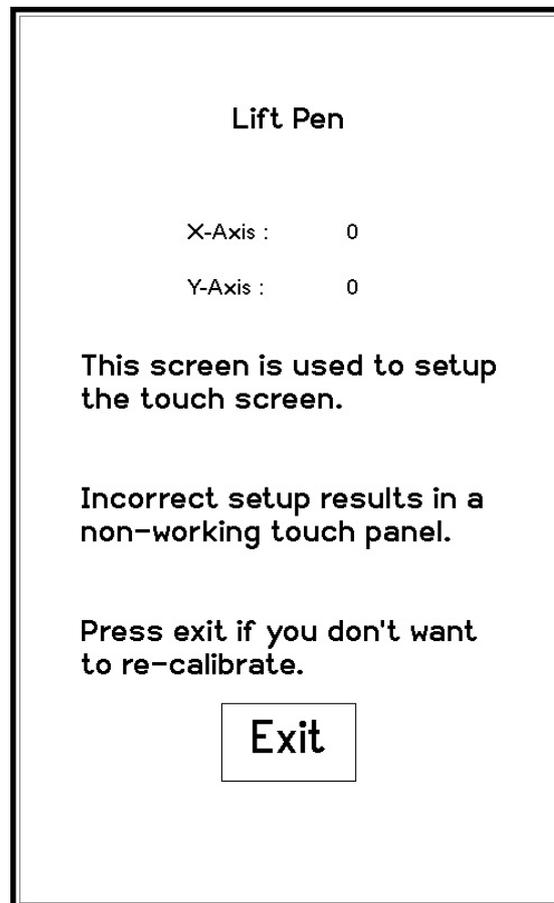


Figure 8

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. This process exits the touch screen calibration and continues with the standard start up procedure.

If touch calibration is required, follow the below procedures:

Press and hold finger where the two lines meet inside the small box (Figure 7 bottom 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 (Figure 8). The software will then prompt for three more touch zones resulting in co-ordinates for all four corners of the screen.

Once calibration is completed the software automatically begins the standard start up procedure.

WIND SPEED SETUP – FIGURES 9, 10 & 11

Live wind speed is shown on the screen permanently (figure 9) but the units of measure and the maximum wind speed can be adjusted on the screen using the following steps:

1. To access the wind speed menu from the operating screen, press the block where the current wind speed is displayed, a **Password** screen will be displayed (figure 10).
2. Enter the three digit password [- - -] followed by the **Enter** button the Set Limit screen will be displayed (figure 11).

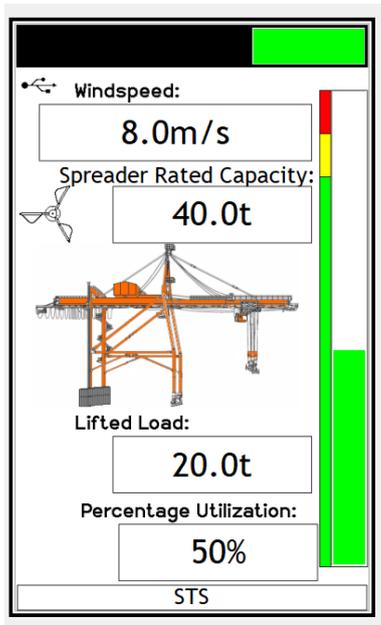


Figure 9

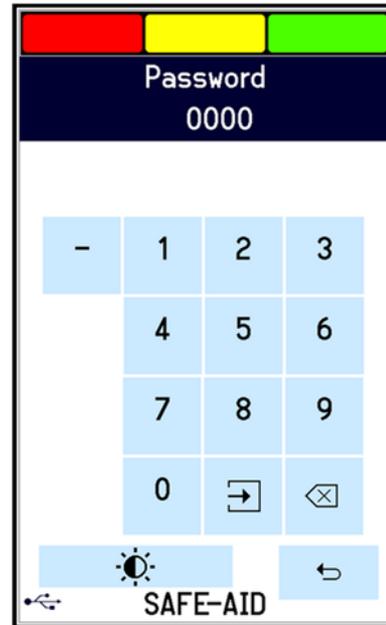


Figure 10

3. Change the units of measure by pressing the blue area of the screen where Set Limit and the limit value are written. The units of measure will change each time the area is pressed i.e. m/s – meters per second, kts - knots, mph – miles per hour and km/h – kilometers per hour.
4. Once you have selected the correct units of measure use the keypad to type in the limit value required then press **Enter**.

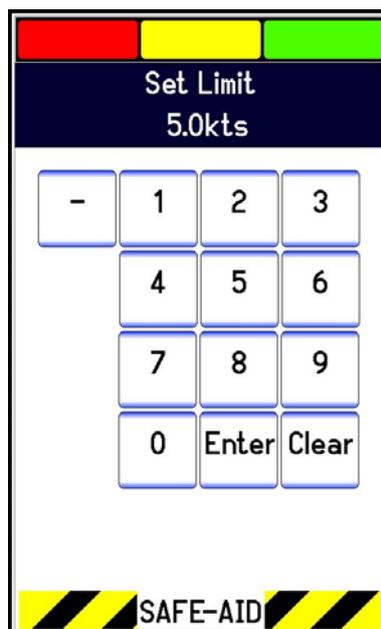


Figure 11

SCREEN BRIGHTNESS – FIGURES 12 & 13

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 (figure 12).

2. Press the  and the Brightness adjust screen (figure 13) 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.

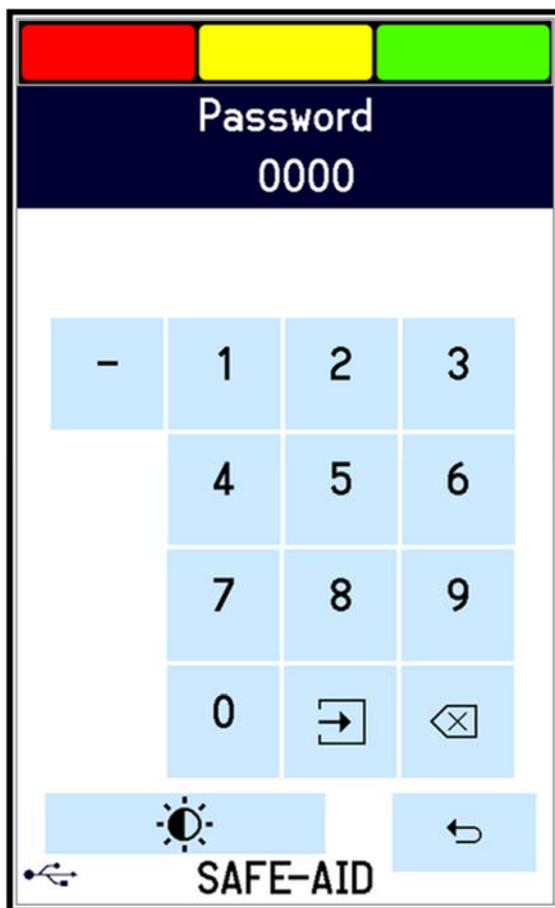


Figure 12

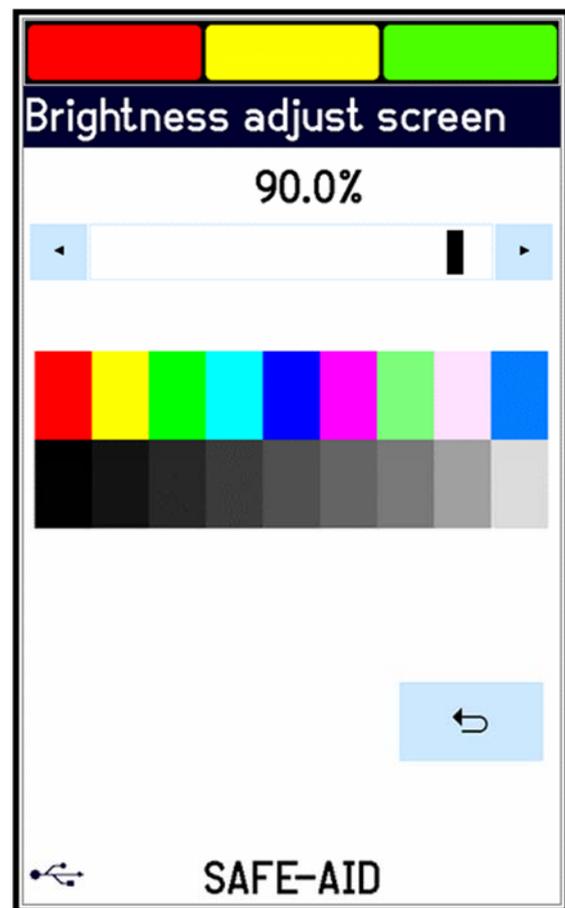


Figure 13

