

CS630 Spreader Controller

User Manual



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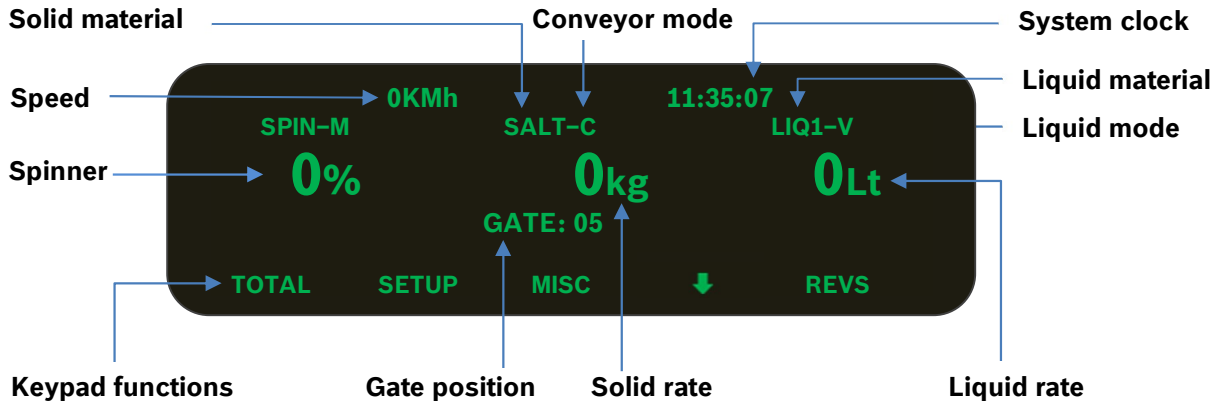
1 LAYOUT

CS 630 is a three function programmable controller, available in Manual, Closed or Open Loop mode, for the controlled application of granular solids and liquids in snow and ice control.



2 MAIN MENUS

When the truck is stopped or no ground speed signal is coming in, the screen below will be shown:



Key pads from left to right are for TOTAL, SETUP, MISC, SUBMENU and REVS. Press one on the panel enters corresponding menu screen.

TOTAL ---- trip and season totals, data display/save/load

SETUP ---- enter programming mode

MISC ---- adjust the brightness of screen or driver ID if AVL attached

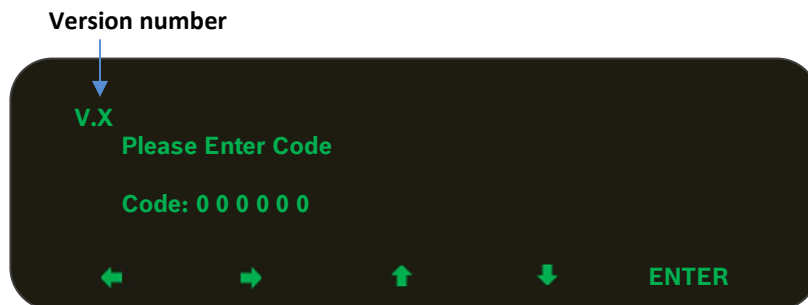
↓ ---- go to submenu to do speed simulation, gate adjustment and material change.

REVS ---- reverse conveyor while holding down

3 AUTHORIZATION VERIFICATION

To set up the CS-630, either a Program Key or a password is required according to the LOCK setting. This is to prevent unauthorized personnel from making adjustments to the system.

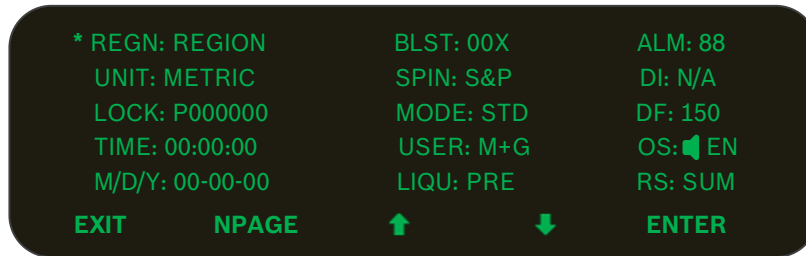
When 'SETUP' is pressed it will either look for the Program Key or prompt for a password as shown here:



The right-most digit stays bright while the rest are dim, pressing the keypad left or right arrow will change the digit, while the up/down arrows change the character. Press **ENTER** to confirm the input. The default password is 000000. The user can change this password once in the setup screen.

4 SYSTEM CONFIGURATION

If the password is correct or program key is present, the setup screen will show on:

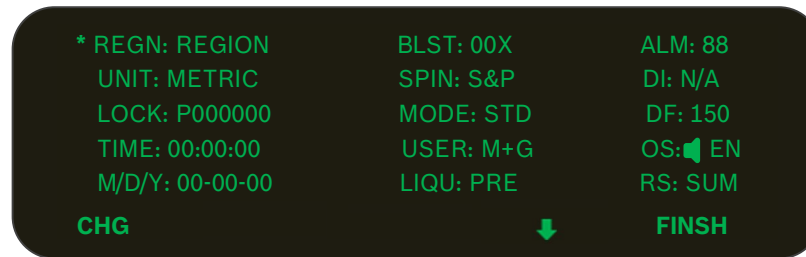


Press Up/down arrow to navigate to the different feature and the symbol * will mark the active line in front. Press **ENTER** to edit/select settings and some may also have a sub menu **CHG** to do edit (see example of the editing of REGN below).

Press **NPAGE** to go to the next screen and **PPAGE** to the former one.

4.1 Setting the Region Name and Truck ID

REGN: To edit the REGION and TRUCK name



Press **↓** to switch between region and truck name. Press **CHG** to start to edit region or truck name, Then press **FINSH** button to quit editing.

4.2 Setting the UNIT

UNIT: To choose the system unit, metric or imperial.

4.3 Authorization method

LOCK: A valid programming key or six characters password can be chosen to verify the access to the setup.

4.4 Setting the Time

TIME: Clock time is formatted as: Hour: Minute: Second

4.5 Setting the Date

Date: is formatted as Month: Day: Year

4.6 Blast Timer and Mode

BLST: The first two digits of "BLST" are timer in unit of second and the last one digit is the mode of blasting.

F --- Blast disabled

C --- Blast at close loop with rate set at material screen.

S --- 100% output even at zero ground speed

X --- 100% output except at zero ground speed

The default setting for blast timer is 60 seconds.

4.7 Spinner Stop Mode

SPIN: Choose the spinner stop mode.

NEV --- spinner will always run when the dial is set.

SPD --- spinner will start and stop with ground speed.

PSE --- spinner will only stop when the pause button is pressed.

S&P --- spinner will stop with ground speed and the pause button

Setting is same as for UNIT.

4.8 System mode

MODE: Standard or Air Gate.

4.9 User Option

USER: This option determines whether truck driver is allowed to change the gate position or not.

N/A --- operator is not allowed to change either gate or material.

M+G --- operator is allowed to change both gate and material.

GAT --- operator is only allowed to change gate .

MAT --- operator is only allowed to change material.

4.10 Setting the Liquid

LIQU: to choose liquid work as either PREWET (PRE) OR ANTI-ICING (DEI).

4.11 Alarm Speed

ALM: This is the ground speed at which a warning will be displayed on the screen. The "Alarm Speed" is not activated when the spread rate is zero or the controller is in the Pause mode.

4.12 Liquid level detection

DI: The liquid sensor feedback can be configured as liquid level detection while sensor cable is connected and liquid works under the open loop.

N/A --- disabled this function.

L-D --- enable this function.

4.13 Setting Dither Frequency

Two options: 66 and 150 Hz

4.14 Setting Beeping and Language

: Enable/disable beeping as feedback to touch pad press.

EN: Default language is English and can switch to French.

4.15 Default Setting and Season Reset

RS: system parameters can be reset to factory defaults or season totals can be reset to zero.

SUM: reset season totals

PAR: reset parameters to factor defaults

A text page will come out to confirm the action.

5 GROUND SPEED CALIBRATION

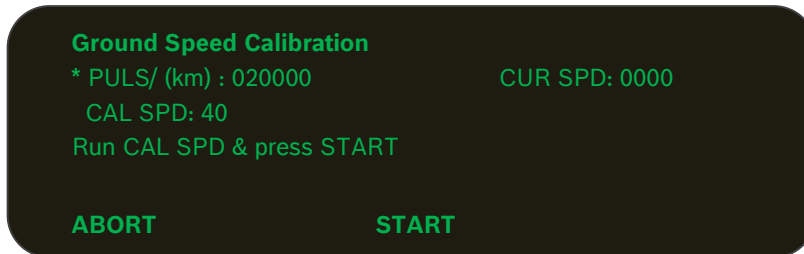
There are two ways to do the speed calibration.

If the resolution is known, just manually input the pulses per KM or Mile.

The other way is to set up the predetermined speed as the speed that truck will run more often. Follow the hints on the screen and allow the system to finish the speed calibration by itself.



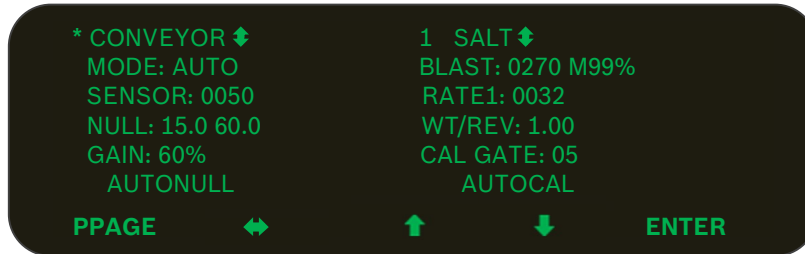
After the predetermined speed is set up, it jumps to the following screen and text message “Run CAL SPD & press START” will flash.



Hold the vehicle speed which is indicated on the vehicle’s speedometer to the CAL SPD before press **START**. After 5 seconds, the system will record the pulse resolution automatically. The speed calibration is completed now.

6 HYDRAULIC VALVE CONFIGURATION

The left side of screen is to set up the valves configuration.



6.1 Valves

Choose valves to edit among conveyor, spinner, prewet or anti-ice(depends the setting of LIQU).

6.2 Mode

Conveyor has five modes: close loop (auto), open loop manual 12V, manual speed or manual.

Spinner can only work under manual mode.

Prewet has seven modes: off, open, V-Flow, slave (Return Oil to Pre-wet), manual speed, manual and manual 12V.

Deice can work under the four modes: off, manual, open and 1 BOOM.

If the Closed loop mode is selected for Conveyor, V-Flow or Return Oil mode for Prewet, and 1Boom is selected for Anti-icing it is able to run Auto Null.

--- Manual Mode

This mode allows the driver to manually control the spread rate. Each setting on the Conveyor Dial is a percentage of maximum null setting. There are 9 configurable application rate settings. The display will show "M" beside solid material name on the operation screen.

--- 12 Volt Triggered Manual Mode

In addition to manual mode operation, this mode allows the controller to start and stop the spreader based on a 12V signal. The display will show "T" on the screen.

--- Ground Speed Triggered Manual Mode

In addition to manual mode operation, this mode will start and stop the spreader based on ground speed input. The display will show "G" on the screen.

--- Open Loop Mode

This mode utilizes the ground speed sensor only to regulate the amount of material that will be dispensed off the vehicle. There are 9 configurable application rate settings available. The display will show "O" on the screen.

--- Closed Loop Mode

This mode utilizes both the conveyor and ground speed sensors to regulate the amount of material that will be dispensed off the vehicle. There are 9 configurable application rate settings available. The display will show "C" on the screen.

-- Off

This turns off the valves. The display will show “N” beside liquid material.

-- V-Flow (Prewet only)

In this mode the liquid system has an inline flow meter which measures flow rate using a pulse rate. The controller will control the liquid flow to be a constant fraction of the conveyor solid flow. The fraction is specified as liters/tonne or gallon/ton. The display will show “V” beside liquid material on the operation screen.

-- Return Oil to Pre-wet (Prewet only)

The pre-wet system consists of a limited flow pump driven by the conveyor motor exhaust oil, but with an additional on-off control signal which is needed to enable the flow. The display will show “R” beside liquid material on the operation screen.

-- 1 BOOM (anti-icing only)

This is a closed loop controller which uses a feedback signal from both the ground speed sensor and the anti-ice flow meter to apply the desired application rate in units of volume per distance travelled. The display will show “1” beside anti-ice material on the operation screen.

6.3 Sensor

Determine the number of pulses per revolution of conveyor when close mode is selected. During nulling or autonulling, this line will show the conveyor speed.

6.4 Null

1. Press **ENTER** to null manually and it starts with minimal value immediately
2. Use up and down arrows to adjust speed so that the motor just begins to turn
3. Press **↔** to end “Min” value editing and switch to the maximum value
4. Do the same for “Max” except adjust the motor to a safe maximum speed or until the RRM readout stops to increase.

6.5 Autonulling

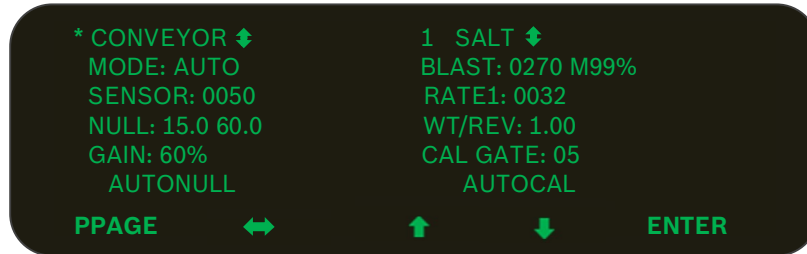
The nulling of the solenoids for minimum and maximum values can also be accomplished automatically. Press the **ENTER** to start and the text “Autonulling” will flash on the screen during procedure. Autonull will end after recording the nulling values.

6.6 Gain

This is the percentage of valve output increase, introduced on conveyor start up, when the vehicle starts to move, to overcome hydraulic motor pulsing and provide for instant, continuous movement of the conveyor.

7 MATERIAL CONFIGURATION

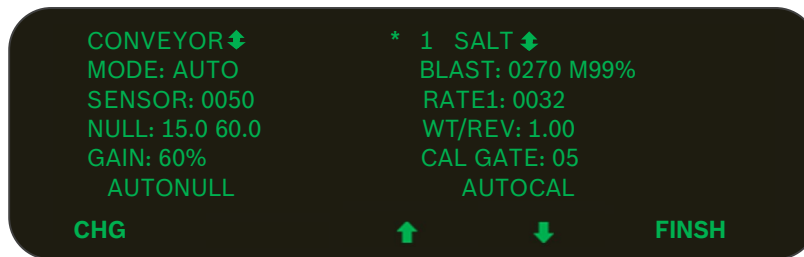
There are four materials for solid, liquid and deice under the standard mode and two solid materials with air gate mode. Within the valves configuration page, the right side is for the corresponding material configuration.



Using **↔** or **↓** move from conveyor configuration to material configuration.

7.1 Material Name

Press **ENTER** allow to choose different solid/liquid/deice material.



Use up/down arrow to view each material's settings and press **FINSH** to select the material. If **CHG** is pressed, system will start to edit the material name which is consist of 4 characters.

After finish editing the material name then press **DONE**.

7.2 BLAST RATE

BLAST: The first number is the blast rate for blast close loop and the next one is the percent of manual blast.

7.3 APPLICATION RATES

RATE: There are 9 settings of the application rate for each material when the conveyor works in open or close loop.

Press **ENTER** and then **up/down** arrow to browse the rate setting values, and press **CHG** to edit the current rate value.

7.4 WT/REV (PLS/LT)

This setting refers to the weight of material discharging from the main conveyor for every revolution of the conveyor or the number of feedback sensor pulses per volume of liquid delivered by the pump.

Note: This number will automatically be generated as a result of the weight calibration process (Autocal) or input manually.

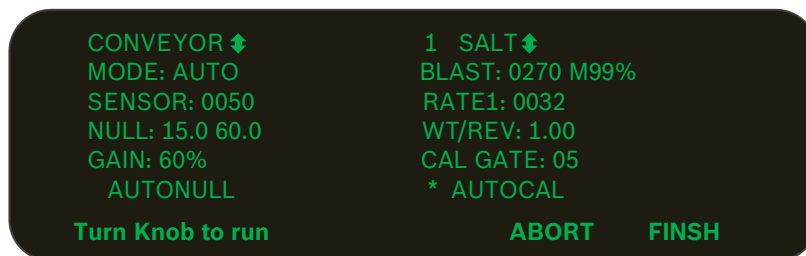
7.5 CAL GATE

It is the place to input the gate value for solid material calibration.

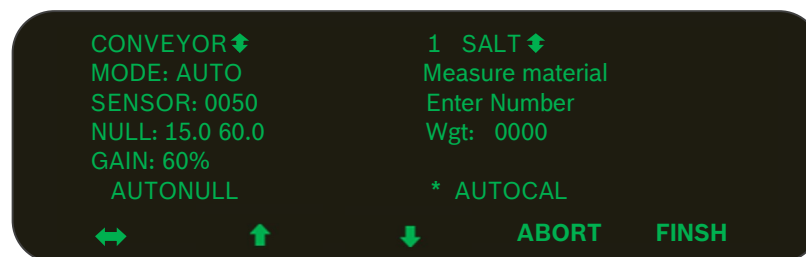
7.6 AUTOCAL

Here is the place to do the material calibration.

1. Place an adequate catch container under the spreader discharge chute.
2. Make sure that sufficient material in the hopper and the system is safe to run.
3. Set gate position.
4. Press **ENTER** to proceed.
5. Turn CONV knob to run.
6. Press **FINSH** when desired amount is reached.



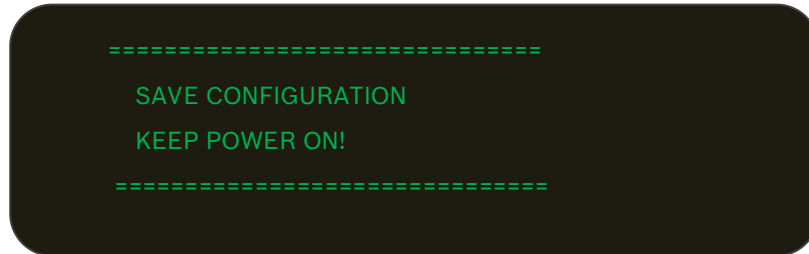
After press **FINSH**, it will go to the page to input the material weight or liquid volume (has one decimal point) to calculate the WT/REV or PLS/GA and the result will be displayed on the screen.



8 DATA SAVING/LOADING/DISPLAYING

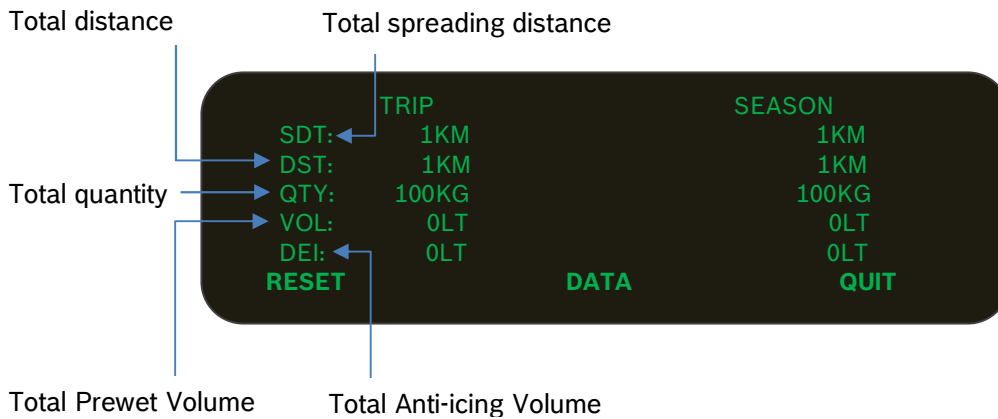
8.1 Save parameters to system

All the changes made on parameters will be updated and saved after press **EXIT** on the setup screen, system will also give a text message screen as below.



8.2 Display the trip and season totals

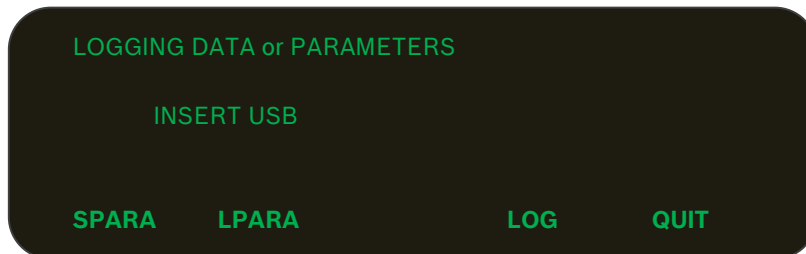
When truck is stopped, Press **TOTAL** to display trip and season totals.



Press **RESET** will go to clear the TRIP TOTALS, while SEASON TOTALS can only be cleared in the setup screen.

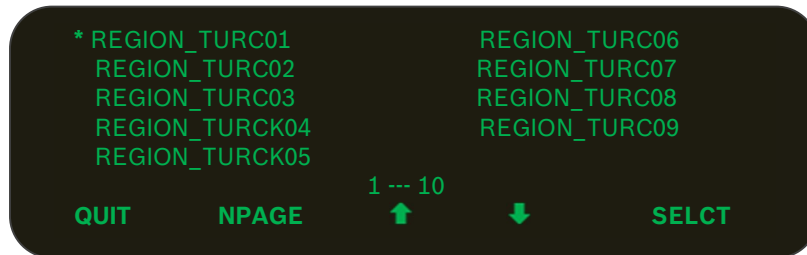
8.3 Save parameters to USB

Press **DATA**, insert program key and follow the hints on screen. Once "USB FOUND" appears, press **SPARA** will save all parameters on the USB with file name including region and truck names.

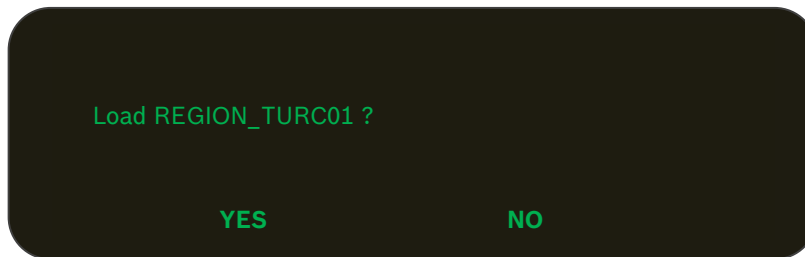


8.4 Load parameters from USB to Controller

It is also possible to load saved parameters from USB to controller on the screen. By pressing **LPARA**, It will list all the parameters files on the USB.



Use up/down arrow to navigate and press **SELCT** to load the desired parameter file.



Once confirmed all the parameters will be refreshed in the memory. To save the loaded parameters, it needs to enter the setup screen and exit normally.

8.5 Save logging data to USB

When truck is stopped, Press **TOTAL** first, then press **DATA**, insert log key and follow the hints on screen. Except save/load parameters between USB and controller, Press **LOG** can also save all spreading log on the USB with file name including region and truck names. The text "SAVING..." will be gone after system saving the spreading log on the USB and clear it on the controller.

9 SUB Menus

9.1 SPEED SIMULATION

When truck is stopped, press **↓** go to the screen as below.



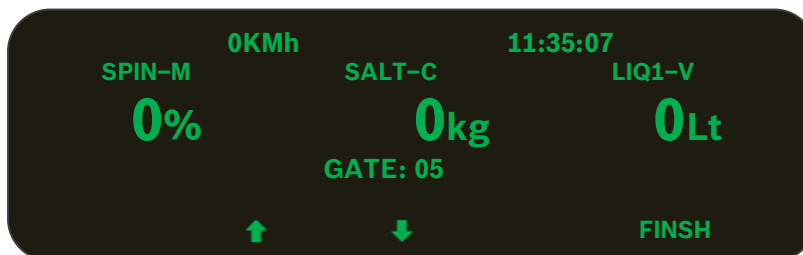
Press **SMSPD** to enter the screen of speed simulation.



- Make sure that the vehicle is stationary (ground speed = 0)
- Press UP and DOWN buttons to adjust simulated ground speed.
- Under the simulation mode, the system still counts the spreading information into log, so please clear that by resetting screen totals and retrieving logging data with USB.

9.2 Gate Adjustment

Depend on the setting of USER option in the setup screen, GAT and MAT may show up on the sub menus. If, GATE is there, Press **↔GAT** to enter the screen of gate adjustment.



Change the gate value as required and press **FINSH** button to exit.

9.3 Material change

If \leftrightarrow MAT is there, Press it to enter the screen of material change.



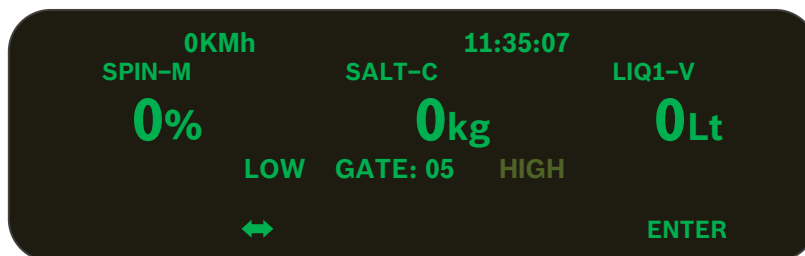
Press **SOLID** or **LIQUD** to change solid material or liquid material. A reminder screen of the calibrated gate of new solid material will last for 5 seconds.

9.4 Air Gate

If air mode is the chosen of Mode at the setup screen, it will show menu "AIRGT" instead of "GAT" and/or "MAT".



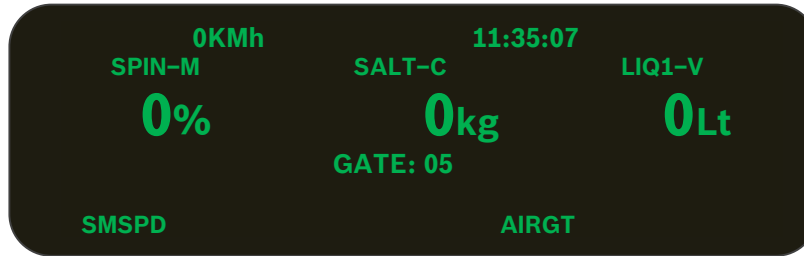
Press **AIRGT** to switch the air gate position, the chosen one is brighter.



Press **ENTER** again to exit.

10 ERROR MESSAGE

The errors checked by system are listed below.

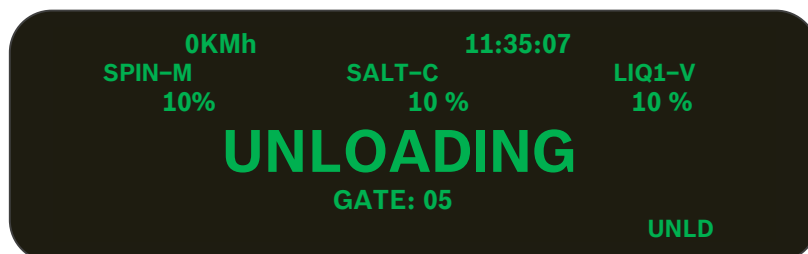


Audible signal comes on for 4 seconds when an error occurs, then goes off. Some error code show on the screen first and come back on 3 minutes later if it is not resolved, while others stays on the screen until cycle power or resolved.

Error Messages	Suggested Solution	Cycle power Needed?
BLAST2LONG	Turn off blast	No
DEICE BLST2LONG	Turn off blast	No
OVERSPEED	Slow down, reset max speed	No
SPIN OUTPUT	Check cables, replace coil	Yes
CONV OUTPUT	Check cables, replace coil	Yes
LIQ OUTPUT	Check cables, replace coil	Yes
DEICE OUTPUT	Check cables, replace coil	Yes
NO LIQ DETECT	Load material, check sensor	Yes
NO CONVEYOR	Check cable/sensor	No, switch to open loop
NO LIQUID	Check cable/sensor	No, switch to open loop
NO DEICE	Check cable/sensor	No, switch to open loop
COIL SHORT	Check cables, replace coil	Yes

11 UNLOAD

Press **UNLD** to unload and the text "UNLOADING" shows on the screen. (Note: The vehicle must be stationary.)



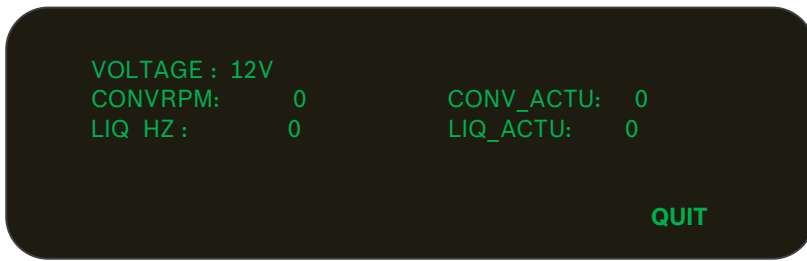
Turn the dials until the desired speed is achieved. Press **QUIT** to exit unload mode. Moving the vehicle will suspend the unload process. It will automatically resume when the truck is stopped again.

12 SPREADING SCREEN

When truck is moving, system will display spreading screen.



Press **STAT** will go to the diagnosis screen which displays the power voltage, actual conveyor RPM and rate, liquid speed and actual rate.



REVS only appears when liquid is selected for Prewet with system working under standard mode. Press and hold the **REVS** to change the direction of the conveyor. Release the button to resume spreading.

13 PAUSE/BLAST

The two encoders for spinner and conveyor are also labelled as pause and blast knob. Press down the Pause to pause and press again to resume spreading. Besides, the “Boot-up pause” will appear if pause is pressed before power off. Press the Blast to increase the spreading output, and press again or wait for blast timer out to resume regular rate.

Remote pause/blast is optional by connecting momentary switch to the digital inputs on the sensor cable. When blast timer is zero, both knob and remote switch work on momentary mode, holding the switch or knob to activate blasting, release to stop.

If the blast timer is not zero, knob and switch work on latched mode. Press down knob one time to blast, blast will stop once timeout or press again before timeout. The remote switch does the same way. Plus, knob can work together with remote switch, you can turn on blasting on knob and turn off from remote switch, vice versa. For pause, it can be activated/deactivated in parallel either from the knobs or remote switches.

14 UPDATE FIRMWARE

Copy the latest bin file to the root directory of USB Program Key and rename it to Rexroth.bin, plug it into the USB port and then power on the controller, it will upgrade firmware automatically. Unplug the USB stick once “Verified” shown on the screen. If “Verified failed” appears, copy the bin file to a blank USB and try again.

15 LOGGING REPORT

15.1 Import the logging data to computer

Once logging data is saved on the USB memory stick (see section 8.3), it can be viewed on the computer with an Excel tool (CS530_Datalog.xlsm).

Press the button “Import Log Data” will check to see if a USB log key is present. If so, then truck data files will be read into and displayed at Data zone. A new dialog window will pop up to indicate the completion of import. The original log files will be deleted on the USB stick.

The screenshot shows the CS530 Logging software interface. At the top, it says "CS530 Logging V3.0". There is a control panel with a green background containing a "Import Log Data" button, a "REGION" dropdown menu (currently showing TOROTO), a "TRUCK" dropdown menu (showing TUCK03 and TUCK04), radio buttons for "All Data" and "Specific", "From" and "To" date pickers (3/7/2017 and 4/13/2017), and "Delete Truck" and "Display Truck" buttons. Below this is a data table with columns: Region, Truck, Date, Start Time (secs), Solid Material, Total Time (secs), Total Distance (ml), Spread Distance (ml), Total Solid (lb), Total Prewet (gl), and Total Deice (gl). A red box highlights a portion of the table. A "Microsoft Excel" dialog box is overlaid on the table, displaying the message "15 files have been imported !" and an "OK" button.

Region	Truck	Date	Start Time (secs)	Solid Material	Total Time (secs)	Total Distance (ml)	Spread Distance (ml)	Total Solid (lb)	Total Prewet (gl)	Total Deice (gl)
TOROTO	TUCK03	03-08-2017	08:59:46	MAT4	00:57:25	42.81	42.67	4101	0	0
TOROTO	TUCK03	03-08-2017	09:57:11	SAND	00:09:53	5.83	5.74	1117		
TOROTO	TUCK03	03-08-2017	10:31:52	MIXD	00:01:42	1.03	1.00	117		
TOROTO	TUCK04	03-08-2017	10:33:51	MIXD	00:35:31	23.06	23.01	3005		
WELLND	TUCK01	03-08-2017	08:59:46	MAT4	00:57:25	42.81	42.67	4101		
WELLND	TUCK01	03-08-2017	09:57:11	SAND	00:09:53	5.83	5.74	1117		
WELLND	TUCK01	03-08-2017	10:31:52	MIXD	00:01:42	1.03	1.00	117		
WELLND	TUCK02	03-10-2017	09:04:24	MIXD	00:23:14	11.80	11.78	1551		
WELLND	TUCK02	03-10-2017	09:27:38	MAT4	00:09:29	5.09	5.05	477		
BURLIN	TUCK01	03-08-2017	08:59:46	MAT4	00:57:25	42.81	42.67	4101		
BURLIN	TUCK01	03-08-2017	09:57:11	SAND	00:09:53	5.83	5.74	1117		
BURLIN	TUCK01	03-08-2017	10:31:52	MIXD	00:01:42	1.03	1.00	117	0	0
BURLIN	TUCK02	03-08-2017	10:33:51	MIXD	00:35:31	23.06	23.01	3005	0	0

15.2 Select Report

All the logging data will be displayed in the data zone. It is also possible to select the logging data involving multiple trucks under a region.

When selecting data, if option **All Data** is selected and no specific truck is selected, then all the trucks in that region will be used. Further filtered report can be done by selecting truck name, date and time when **Specific** is selected.

- To select start and end of the date and hours

CS530 Logging v3.0

Import Log Data

REGION
 TOROTO
 WELLND
 BURLIN
 MAKHAM

TRUCK
 TUCK03
 TUCK04

All Data
 Specific

From 3/7/2017 Midnight
 To 4/13/2017 Midnight

Delete Truck Display Truck

Region	Truck	Date	Start Time (secs)	Solid Material	Total Time (secs)	Total Distance (ml)	Spread Distance (ml)	Total Solid (lb)	Total Prewet (gl)	Total Deice (gl)
TOROTO	TUCK03	03-08-2017	08:59:46	MAT4	00:57:25	42.81	42.67	4101	0	0
TOROTO	TUCK03	03-08-2017	09:57:11	SAND	00:09:53	5.83	5.74	1117	0	0
TOROTO	TUCK03	03-08-2017	10:31:52	MIXD	00:01:42	1.03	1.00	117	0	0
TOROTO	TUCK04	03-08-2017	10:33:51	MIXD	00:35:31	23.06	23.01	3005	0	0
WELLND	TUCK01	03-08-2017	08:59:46	MAT4	00:57:25	42.81	42.67	4101	0	0
WELLND	TUCK01	03-08-2017	09:57:11	SAND	00:09:53	5.83	5.74	1117	0	0
WELLND	TUCK01	03-08-2017	10:31:52	MIXD	00:01:42	1.03	1.00	117	0	0
WELLND	TUCK02	03-10-2017	09:04:24	MIXD	00:23:14	11.80	11.78	1551	0	0
WELLND	TUCK02	03-10-2017	09:27:38	MAT4	00:09:29	5.09	5.05	477	0	0
BURLIN	TUCK01	03-08-2017	08:59:46	MAT4	00:57:25	42.81	42.67	4101	0	0
BURLIN	TUCK01	03-08-2017	09:57:11	SAND	00:09:53	5.83	5.74	1117	0	0
BURLIN	TUCK01	03-08-2017	10:31:52	MIXD	00:01:42	1.03	1.00	117	0	0
BURLIN	TUCK02	03-08-2017	10:33:51	MIXD	00:35:31	23.06	23.01	3005	0	0

Main Data Report

- Specific allows to choose records within a selected timing frame

15.3 View Report

The logging reports will be displayed on the sheet called "Report" by clicking on 'Display Truck' after choosing the criteria at the above section. For example, here you can select region "Toroto" and truck "TUCK03".

CS530 Logging v3.0

Import Log Data

REGION

TOROTO ▲
 WELLND
 BURLIN
 MAKHAM ▼

TRUCK

TUCK03
 TUCK04

All Data

Specific

From 3/7/2017

To 4/13/2017

Midnight ▼

Midnight ▼

Delete Truck
Display Truck

Region	Truck	Date	Start Time (secs)	Solid Material	Total Time (secs)	Total Distance (ml)	Spread Distance (ml)	Total Solid (lb)	Total Prewet (gl)	Total Deice (gl)
TOROTO	TUCK03	03-08-2017	08:59:46	MAT4	00:57:25	42.81	42.67	4101	0	0
TOROTO	TUCK03	03-08-2017	09:57:11	SAND	00:09:53	5.83	5.74	1117	0	0
TOROTO	TUCK03	03-08-2017	10:31:52	MIXD	00:01:42	1.03	1.00	117	0	0
TOROTO	TUCK04	03-08-2017	10:33:51	MIXD	00:35:31	23.06	23.01	3005	0	0
WELLND	TUCK01	03-08-2017	08:59:46	MAT4	00:57:25	42.81	42.67	4101	0	0
WELLND	TUCK01	03-08-2017	09:57:11	SAND	00:09:53	5.83	5.74	1117	0	0
WELLND	TUCK01	03-08-2017	10:31:52	MIXD	00:01:42	1.03	1.00	117	0	0
WELLND	TUCK02	03-10-2017	09:04:24	MIXD	00:23:14	11.80	11.78	1551	0	0
WELLND	TUCK02	03-10-2017	09:27:38	MAT4	00:09:29	5.09	5.05	477	0	0
BURLIN	TUCK01	03-08-2017	08:59:46	MAT4	00:57:25	42.81	42.67	4101	0	0
BURLIN	TUCK01	03-08-2017	09:57:11	SAND	00:09:53	5.83	5.74	1117	0	0
BURLIN	TUCK01	03-08-2017	10:31:52	MIXD	00:01:42	1.03	1.00	117	0	0
BURLIN	TUCK02	03-08-2017	10:33:51	MIXD	00:35:31	23.06	23.01	3005	0	0

Main_Data Report (+)

•Click **Display Truck** will go to Report Sheet

Region	Truck	Date	Start Time (secs)	Solid Material	Total Time (secs)	Total Distance (ml)	Spread Distance (ml)	Total Solid (lb)	Total Prewet (gl)	Total Deice (gl)
TOROTO	TUCK03	03-08-2017	08:59:46	MAT4	00:57:25	42.81	42.67	4101	0	0
TOROTO	TUCK03	03-08-2017	09:57:11	SAND	00:09:53	5.83	5.74	1117	0	0
TOROTO	TUCK03	03-08-2017	10:31:52	MIXD	00:01:42	1.03	1	117	0	0
				SubTotal	01:09:00	49.67	49.41	5335	0	0

Main_Data Report (+)

15.4 Delete Truck

Truck data or region can be cleaned by clicking “delete Truck”. Warning message will pop out to confirm the operation.

CS530 Logging V3.0

Import Log Data

REGION: TOROTO, WELLND, BURLIN, MAKHAM

TRUCK: TUCK03, TUCK04

Warning: The selected truck will be deleted!
Press 'Yes' to proceed or 'No' to cancel.

Region	Truck	Date	Start Time (secs)	Solid Material	Total Time (secs)	Total Distance (m)				
TOROTO	TUCK03	03-08-2017	08:59:46	MAT4	00:57:25	42.81	42.67	4101	0	0
TOROTO	TUCK03	03-08-2017	09:57:11	SAND	00:09:53	5.83	5.74	1117	0	0
TOROTO	TUCK03	03-08-2017	10:31:52	MIXD	00:01:42	1.03	1.00	117	0	0
TOROTO	TUCK04	03-08-2017	10:33:51	MIXD	00:35:31	23.06	23.01	3005	0	0
WELLND	TUCK01	03-08-2017	08:59:46	MAT4	00:57:25	42.81	42.67	4101	0	0
WELLND	TUCK01	03-08-2017	09:57:11	SAND	00:09:53	5.83	5.74	1117	0	0
WELLND	TUCK01	03-08-2017	10:31:52	MIXD	00:01:42	1.03	1.00	117	0	0
WELLND	TUCK02	03-10-2017	09:04:24	MIXD	00:23:14	11.80	11.78	1551	0	0
WELLND	TUCK02	03-10-2017	09:27:38	MAT4	00:09:29	5.09	5.05	477	0	0
BURLIN	TUCK01	03-08-2017	08:59:46	MAT4	00:57:25	42.81	42.67	4101	0	0
BURLIN	TUCK01	03-08-2017	09:57:11	SAND	00:09:53	5.83	5.74	1117	0	0
BURLIN	TUCK01	03-08-2017	10:31:52	MIXD	00:01:42	1.03	1.00	117	0	0
BURLIN	TUCK02	03-08-2017	10:33:51	MIXD	00:35:31	23.06	23.01	3005	0	0

Main Data Report