rexroth
A Bosch Company

CS660/CS661 Spreader Controller

Calibration Manual

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Please check for updates at: www.boschrexroth.ca/cs

1 Setup Screen Layout

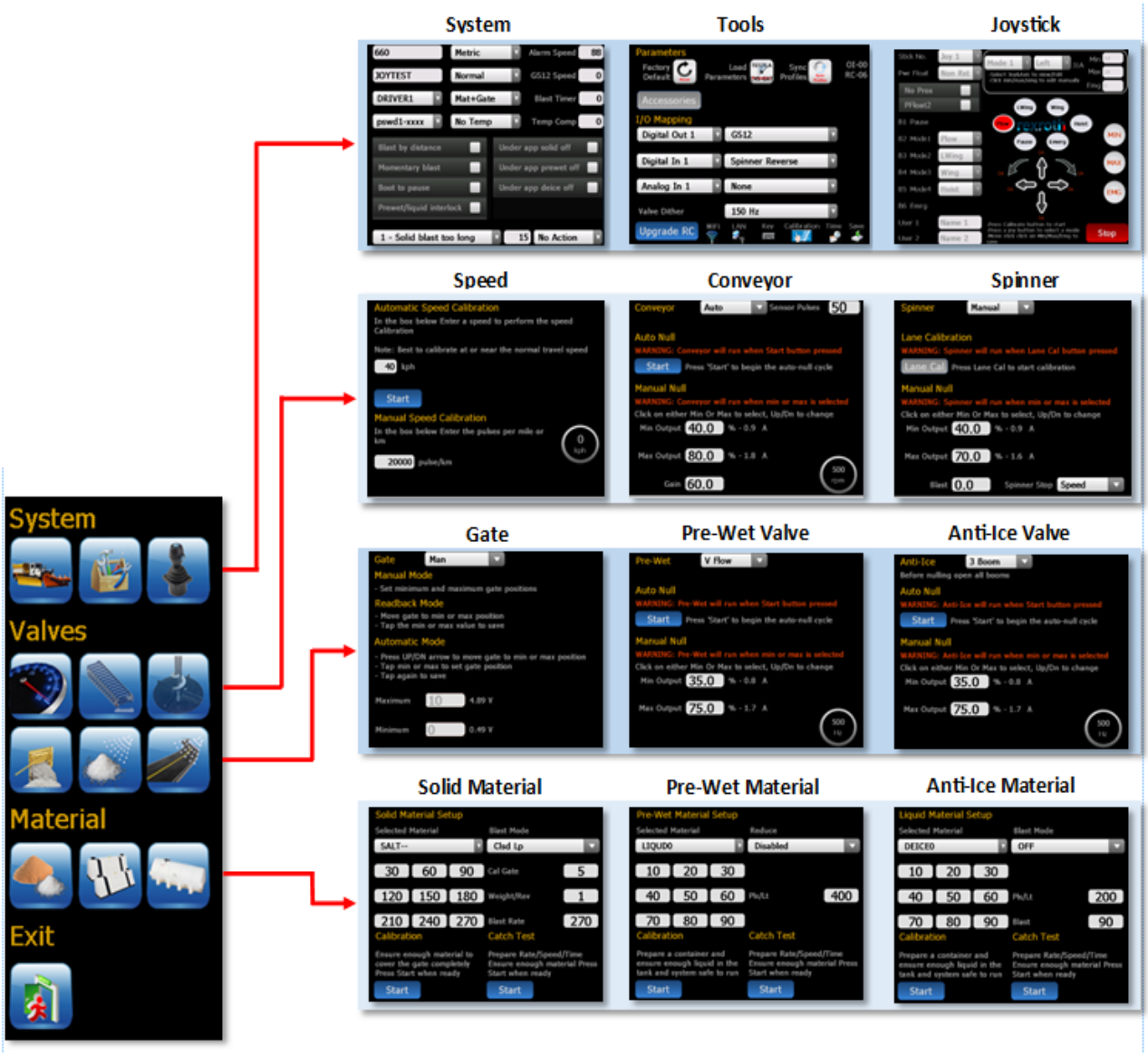
Three steps to set up the system:

System – Truck Info, operation options, operator access level, temp sensor, error severity

Sensors & Valves – Configure all sensors, and valve settings

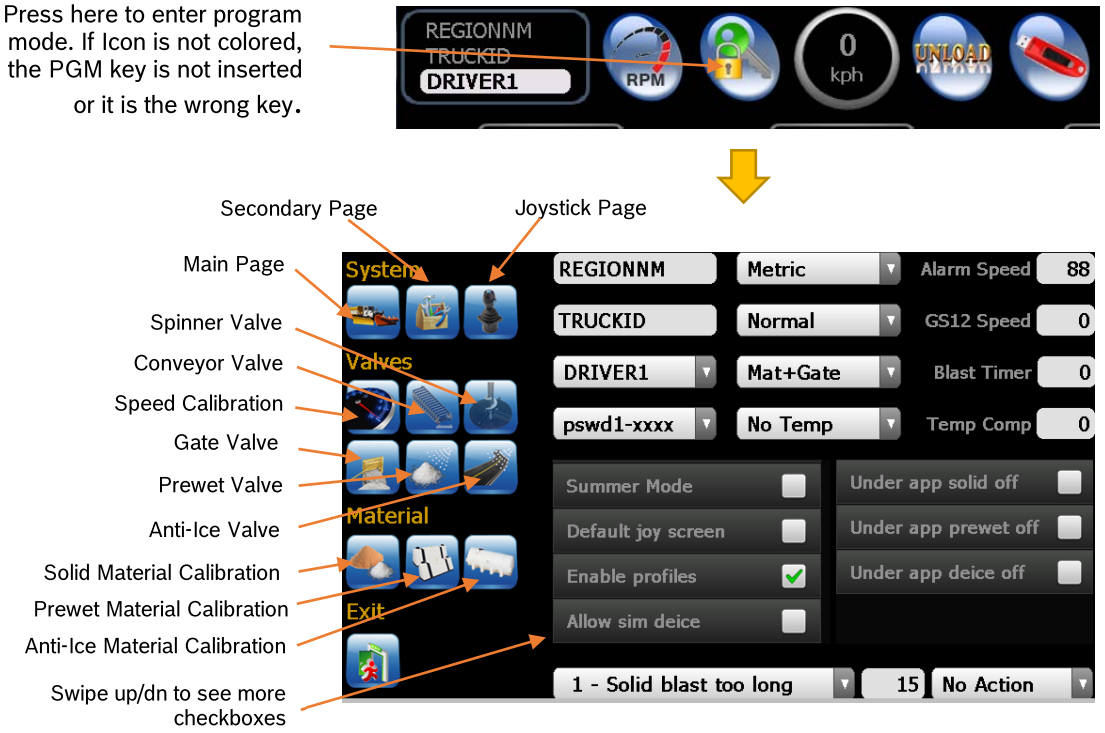
Materials – Set up, and calibrate all solid and liquid materials

Joystick – If joystick function is enabled set up and calibrate all modes and axis



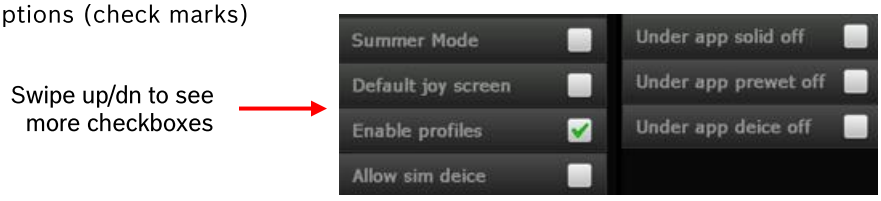
2 Set up for Basic Operation

To enter Programming mode from the operator screen, press the program mode icon with the USB Program key inserted.



2.1 System Configuration

1. Set the units to imperial (LBS/Mile) or metric (Kg/Km).
2. Set the TRUCK ID.
3. Set the REGION NAME.
4. Set the DRIVER ID (optional), 4 driver IDs allowed.
   Note: Configuring driver ID to 'USER" enables operators to enter user defined driver ID on operator screen.
5. Set the type of Temperature Sensor (optional).
6. Set the Options – see Option Checkboxes in this manual
7. Set the items that the user has access to (optional).
8. Set Blast Timer, 0-timer disabled (optional). This should be set less than Err01 delay.
9. Set Percentage of Temp. compensation when there is a 3 degree change (optional).
10. Set the vehicle speed alarm (optional).
11. Select auxiliary options (check marks)



Blast by distance – Operator can enter a distance for blasting (Future option)
Momentary blast – Operator must hold blast button down
Boot to pause – Automatically pause the system on boot
Prewet/liquid interlock - Prewet and Anti-icing operation interlock with an asymmetrical valve
IOT tracking – Enable AVL interface (default is GPS)

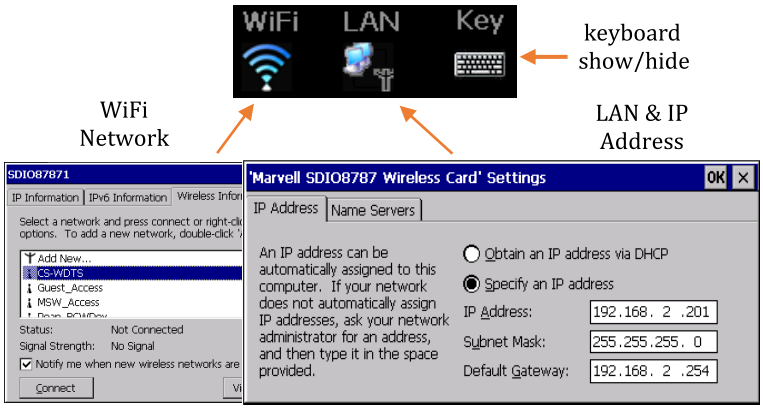
4 Knob Console – Enable external 4 knob console
Eq Rates – Define only start and end rate as well as increment
CRS blast on – Turn on cross conveyor blast
Save last knob – Remember the knob positions when powering off then on again
Voice disabled – Turn off voice feedback
Volume adjust – Allow operator to adjust volume
Summer Mode – Enable summer mode
Default Joy Screen – Always show joystick screen
Enable Profiles – Enable the use of profiles
Allow sim deice – Allow prewet to operate separately from conveyor to provide anti icing
Under app solid off – Turn off solid under application warnings
Under app prewet off – Turn off prewet under application warnings
Under app deice off – Turn off deice under application warnings

12. Press the secondary options icon  to access additional setup parameters. All additional IOs can be set up by using the drop down menus in the I/O mapping section. The drop down fields on the left let you pick an input or output (digital or analog), and the drop down directly to the right is the function of that particular I/O port. For example, you can select “Analog In 2” on the left, and on the right you can select “Temperature” to assign that controller input to be connected to a temperature sensor. Refer to the Special Features with IO mapping section.
    Note: the RC controller wiring must match what is chosen here.

Set WIFI/Network/Screen Calibration/Date&Time (if required).

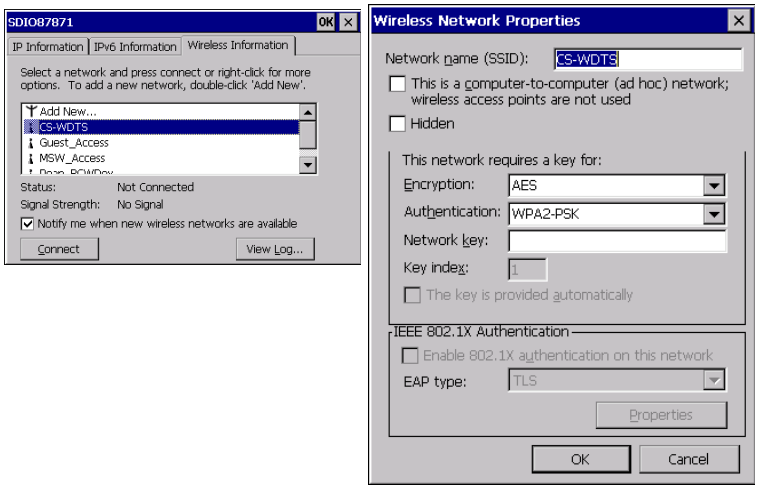
Note: “Save settings” only applies to these items (WiFi, Screen Calibration, Time).

13. Click on WiFi network icon  to set up WIFI connection

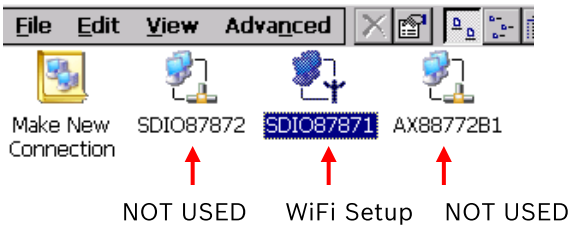


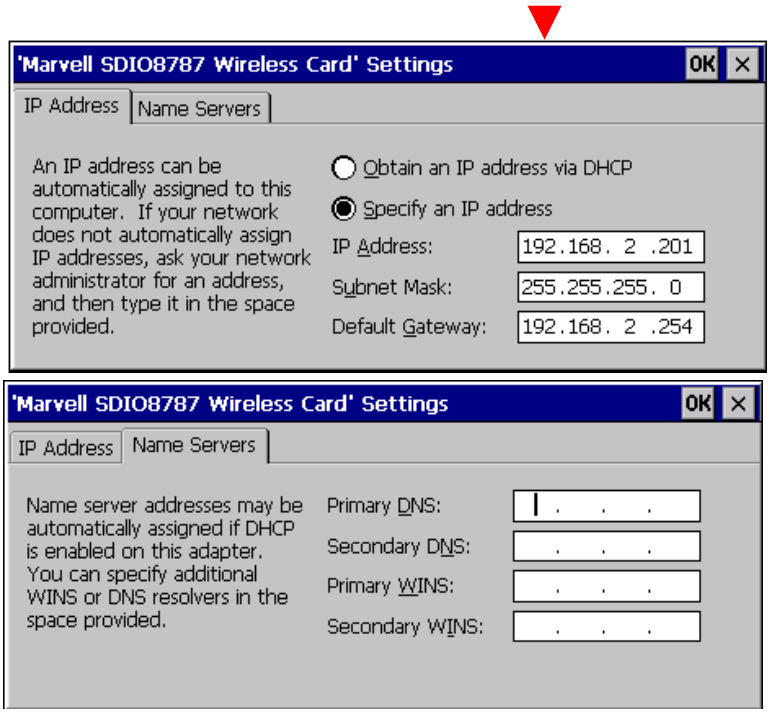
The WiFi setup is almost identical to standard Windows.

- Uncheck ‘Notify me …’ to stop this window from popping up every time the system starts up.
- Click ‘Connect’ and enter Network key



Click on LAN & IP address icon to  configure LAN and assign an IP address





Note: Only one preferred network can be stored at a time, or this will cause a conflict!

If a preferred network already exists, please ensure you have firmware version 6 or higher installed and do the following:

- Close the Wifi setup dialogs shown on the right so you are back to the setup screen.
- Press and hold the WiFi network icon  for 5 seconds to clear any preferred networks.
- Now you can perform the WiFi setup.

Note: Any changes to WiFi/ Network settings/ Time/Screen recalibration need to be saved by clicking the save icon  on the bottom of the screen.

2.2 Input and Output Configuration

To configure appropriate inputs or outputs press the additional options icon to set up I/O Mapping.

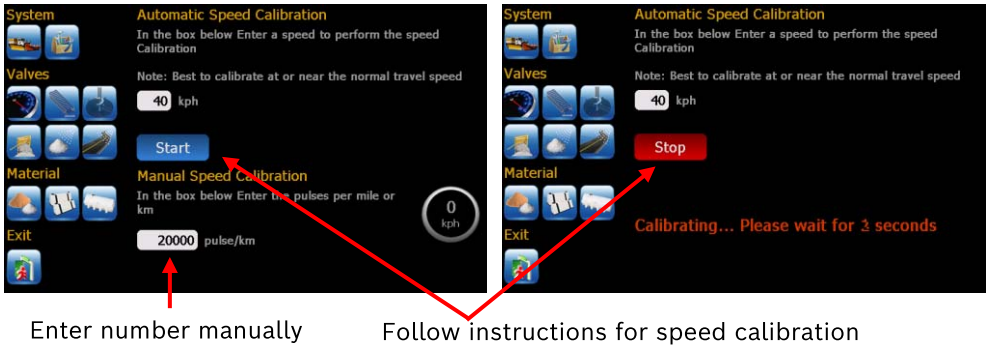
Note: the RC controller wiring must match what is chosen here.

Configurable IO Options

Digital Inputs (DigIn1-8,CANIO DigIn1-8)	Digital Out
Material Detect	GS12 – When there is ground speed
Material Change (1←→3 or 2←→4)	Pause – When spreading paused
Boom Left	ConveyorRvs – When Reverse Button being pushed
Boom Center	Boom Left
Boom Right	Boom Center
Dual Spinner (double rate)	Boom Right
Spinner Reverse	
Conveyor Reverse	**Analog In**
Spreader Off (spn+conv+prewet)	Temperature
DLA Off	Pressure
CRS (cross conveyor on/off)	Low Oil
Re-circulation	Op 1 (Future feature)
Flush	
Body Up	
Plow Down	
Wing Down	
Gate In	
Low Oil	
Pause	
Blast	
Liquid Lvl	
L-R	
Dump Limit	
Air Gate	
PTO Enable	
Vehicle Reverse	
Re-Activate 1	
Re-Activate 2	
...	
Digital Inputs (Aux DigIn1-8)	
L1 – 4 (Light Outputs, 2.2A)	
L5 – 8 (Light Outputs, 3.5A)	

2.3 Ground Speed Calibration

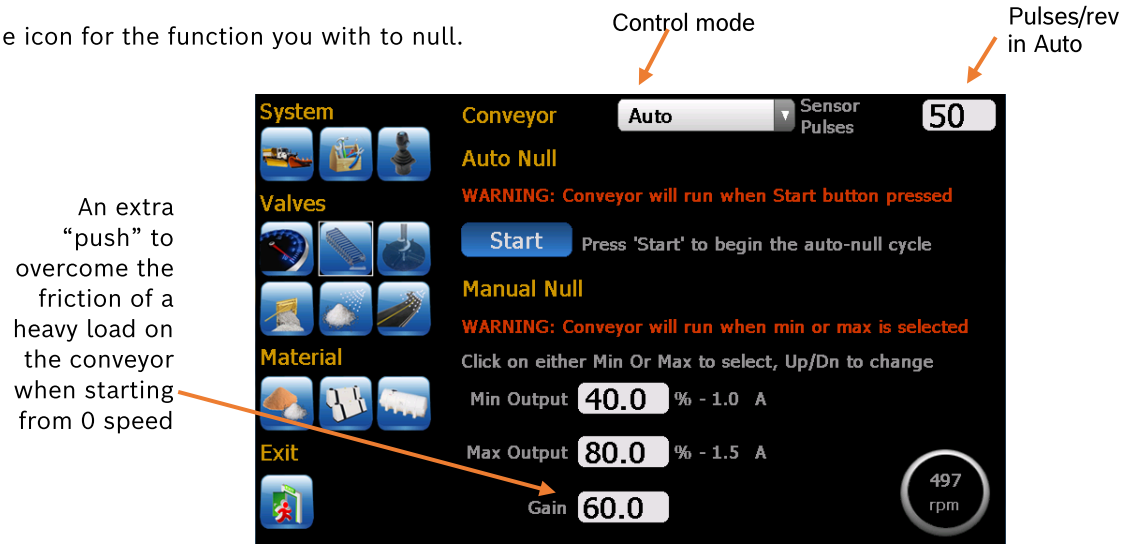
1. Select speed icon  to enter into the ground speed calibration screen.
2. Choose which calibration option best suits your situation. Automatic or manual.



Note: Highly recommended to use the typical vehicle speed during spreading. And a more accurate real time GPS speed is preferred for more precise speed calibration.

2.4 Valve & Sensor Setup

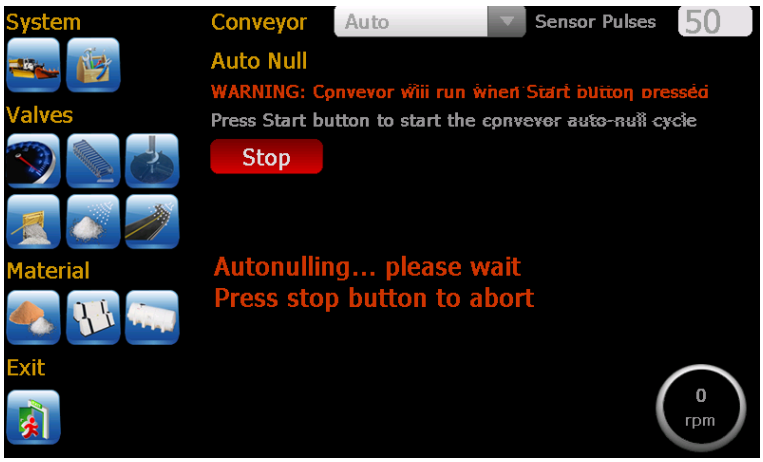
1. Tap the icon for the function you with to null.



2. Select the control mode:
   Spinner –Manual (*default*), Half Lane, One Lane
   Conveyor/Auger – Auto (*default*), Open LP, Man-Spd, Manual
   Prewet – Off, Fixed, V-Flow (*default*), Manual, Manual-SPD, Return Oil, Open Loop
   Anti-Icing (Anti-icing) – Off (*default*), 1 Boom, 3 Boom, Manual %
3. Set correct conveyor sensor pulses/rev if Auto is selected.
4. Ensure the hopper is empty, and the truck is safe to operate.
5. Start the engine to achieve adequate oil flow.
   Note: If the Auto mode is selected it is strongly recommended to run **Auto Null**.

Auto Nulling

1. Press “Start” to begin. This procedure will automatically ramp up the conveyor motor speed and then ramp down to capture the both “Min” and “Max” speed values and storing them as a saved calibration.



Note: This feature can only be used with motors with speed sensor. It takes about 30~60s to complete.

2. Calibrated values will be shown in the Min output & Max output text boxes
3. Please check the “Min” null value to verify it is minimum. (< 5RPM). Do this by pressing on the Min output value (conveyor will start to turn). Press again to stop.

Manual Nulling

1. Press “Min” value field to pop up the UP/DN arrows and enter into edit mode.
2. Use up and down arrows to adjust speed so that the motor just begins to turn
3. Press the “Min” value field again to end the edit mode and accept the value
4. Do the same for “Max” to adjust the motor to a safe max speed or until the RRM readout stops to increase.
5. Forward Gain and Blast settings can also be adjusted

2.5 Material Setup & Calibration

2.5.1 Solid Material Setup

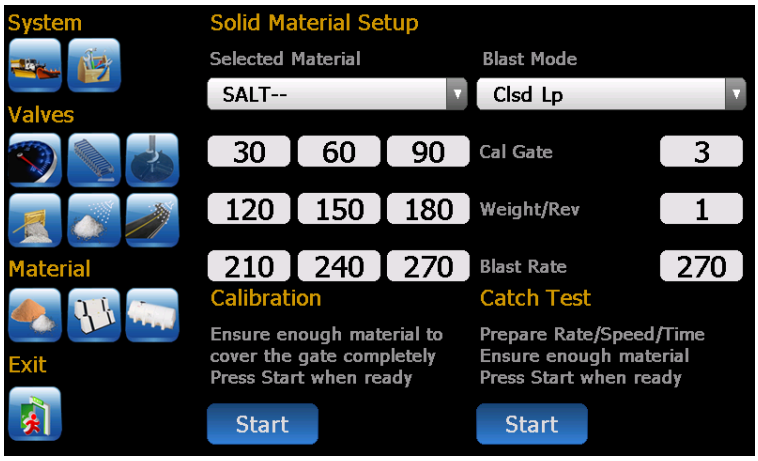
Tap on the solid material icon . to configure materials desired. It allows to set up to 4 different solid materials, and 9 application rates and a blast rate for each material.

Material Names:
Select name from list
Click to popup keypad
Enter to save

Solid Rates:
Setpoints for 9 conveyor knob positions

Unit of Solid Rate:
Kg/km or Lb/mi

Cal Gate:
Gate position used for material calibration



2.5.2 Solid Material Calibration – Manual or Readback Gate

1. Prepare a container to catch material discharged
2. Make sure that sufficient material in the hopper and the system is safe to run.
3. Press ‘START’ to proceed and follow the instruction on the screen

Note: Press “STOP” button to stop the process anytime during calibration.

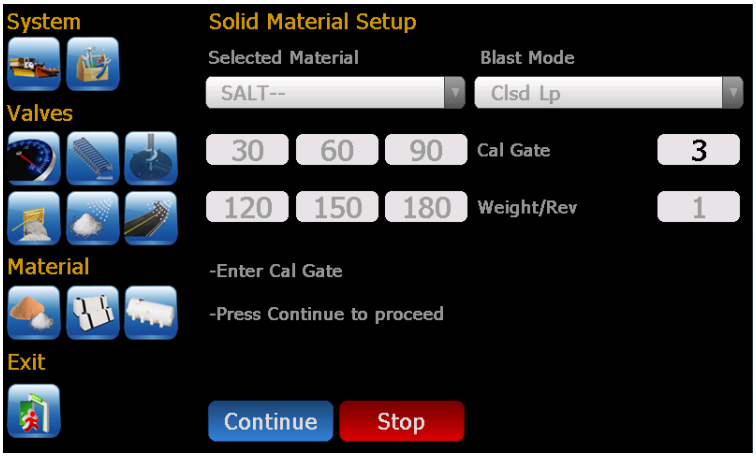
STEP 1

Ensure system safe to run

Manual Gate:
Manually adjust gate & enter the gate position

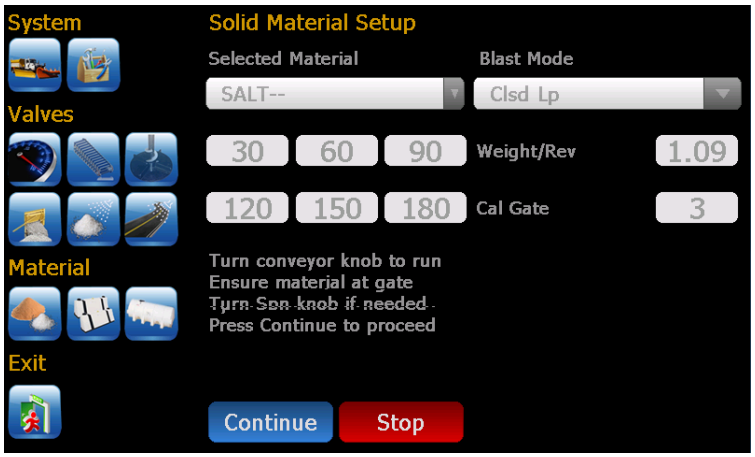
Readback Gate:
Manually adjust gate (no need to enter)

Continue to next step
Stop to abort



STEP 2
Dial to 2nd or 3rd position for decent conveyor speed

Continue to next step
Stop to abort



STEP 3:

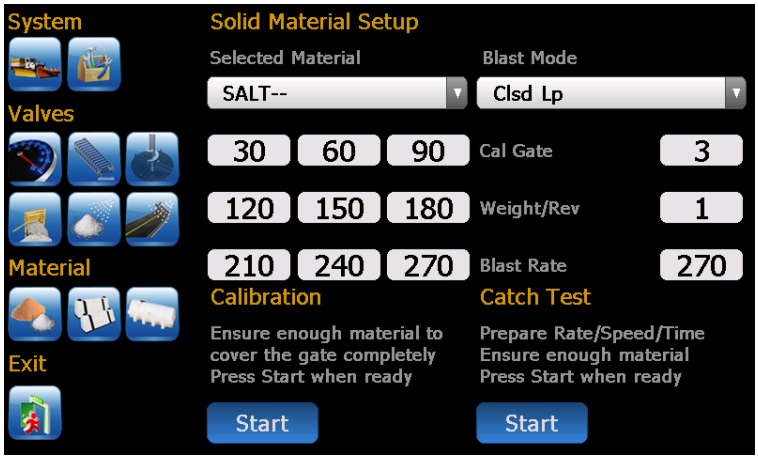
Recommend to discharge minimum 100kg or 220lbs material (more for better resolution)

Enter weight of the material collected

Continue to next step
Stop to abort

Complete!

When the material calibration ends the Wt/Rev at the calibrated gate position is refreshed.



2.5.3 Solid Material Calibration – Auto Gate

1. Prepare a container to catch material discharged
2. Make sure that sufficient material in the hopper and the system is safe to run.
3. Press 'START' to proceed and follow the instruction on the screen

**Auto Gate operation has two calibration points, Wt/Rev at Gate position 1 and 3. Simply follow steps on screen to go through the calibration process.

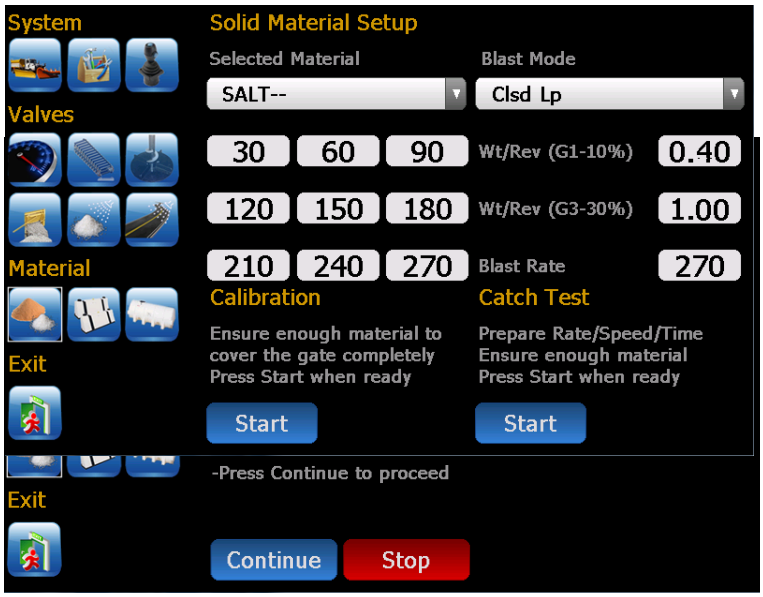
STEP 1:

Ensure system safe to run

STEP 2:

Continue if you have a container ready and sufficient material always above the gate opening throughout the calibration process

Continue to next step
Stop to abort



STEP 3:

Controller automatically move the gate to position 1

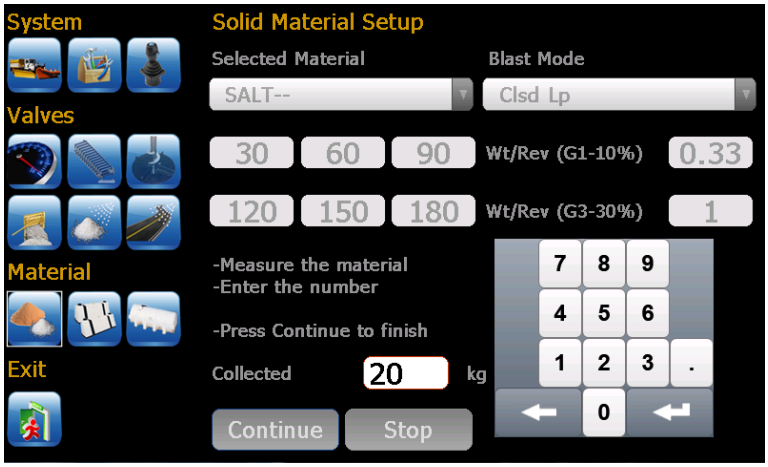
Continue to next step
Stop to abort

STEP 4:

Recommend to discharge minimum 100kg or 220lbs material (more for better resolution)

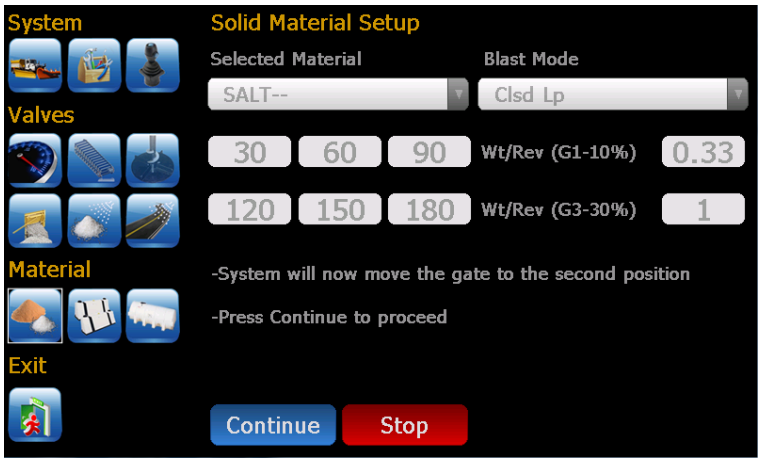
Enter weight of the material collected

Continue to next step
Stop to abort



STEP 5:

Controller automatically move the gate to position 3

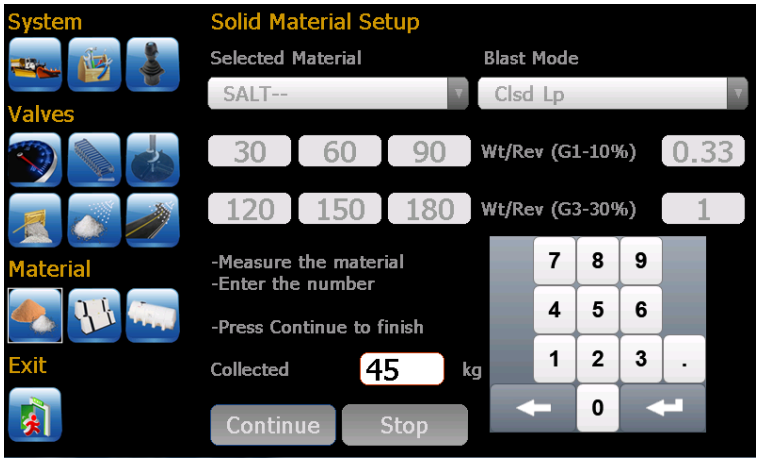


Continue to next step
Stop to abort

STEP 6:

Recommend to discharge minimum 100kg or 220lbs material (more for better resolution)

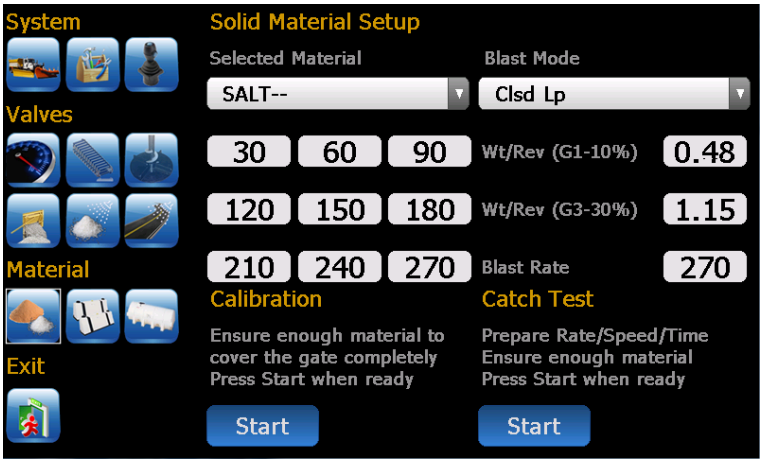
Enter weight of the material collected



Continue to next step
Stop to abort

Complete!

When the material calibration ends both Wt/Revs at calibrated gate position 1 and 3 are refreshed.



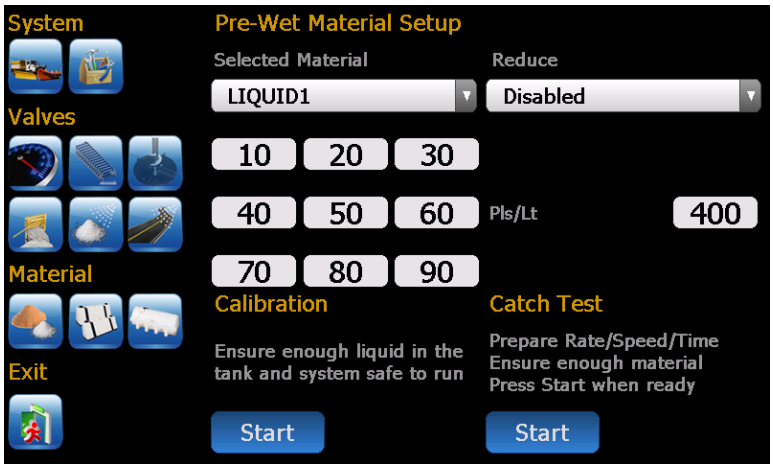
2.5.4 Prewet and Anti-icing Material Setup

Tap on the prewet material icon . or anti-ice material icon to configure materials desired. It supports 4 prewet and 4 anti-ice materials, and 9 application rates and a blast rate for each material.

Material Names:
Select name from list
Click to popup keypad
Enter to save

Unit of Prewet Rate:
Liter/Ton
Gallon/Ton

Unit of Anti-ice Rate:
Liter/Lane.Km
Gallon/Lane.mi



2.5.5 Prewet and Anti-icing Material Calibration

1. Prepare a container to catch liquid discharged
2. Make sure sufficient liquid in the tank and the system is safe to run
3. Press 'START' to proceed, and follow the instruction on the screen

STEP 1
Ensure system safe to run

Continue if you have a container ready and sufficient liquid throughout the calibration process

STEP 2
Dial to 2nd or 3rd position for decent flow

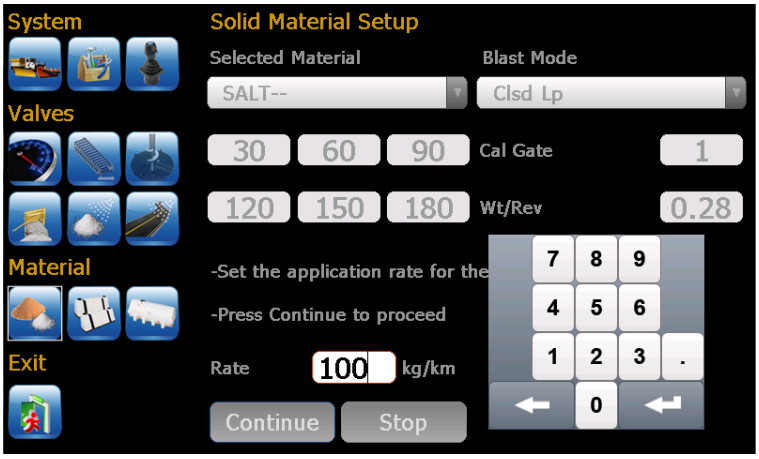
STEP 3
Discharge more liquid for better calibration accuracy

2.6 Material Catch Test

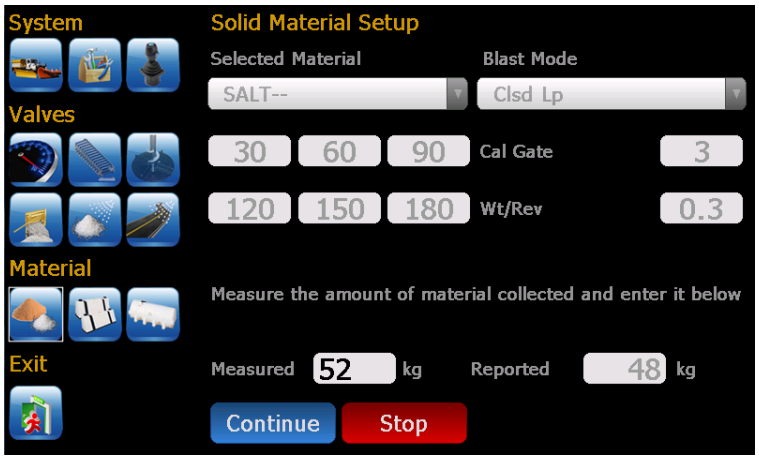
2.6.1 Solid Material Catch Test

1. Tap on solid, prewet or anti-icing icon to enter into the material calibration screen.
2. Place an adequate catch container under the spreader discharge chute.

STEP 1
Enter desired rate speed
Duration
Press '**Continue**'



STEP 2
Measure material
Enter the value
Press '**Continue**'



3. A wt/rev (kg/rev or lb/rev) will be calculated and displayed on the bottom right of the screen.
4. Repeat this procedure for all solid materials (use the left and right arrows to select material types).

2.6.2 Liquid Material Catch Test

These same procedures apply to pre-wet and liquid. The unit of calibrated value is pulses/liter or pulses/gallon.

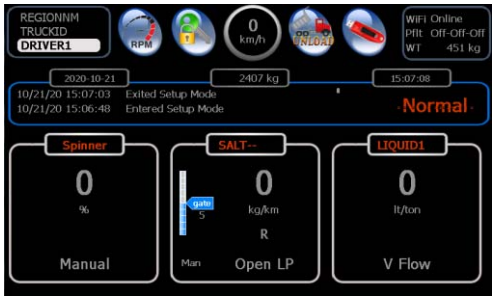
3 Set up for Additional Feature Functions

3.1 Conveyor Reverse

This feature supports bi-directional conveyor operation. It requires a digital input to toggle the direction of the conveyor motor. Once an input is configured for 'ConveyorReverse' the following proportional outputs are automatically mapped:

Junction Box **V1-B** Conveyor Forward
Junction Box **V1-A** Conveyor Reverse

A digIn (Junction Box or CANIO board)



'**R**' – Forward, '**R**' - Reverse

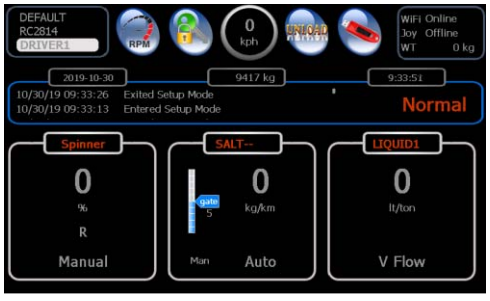
Note: When setting up conveyor valve only forward output needs to be trimmed since both Conveyor forward and Reverse outputs share the same Min & Max null values.

3.2 Spinner Reverse

This feature supports bi-directional spinner operation. It requires a digital input to toggle the direction of the spinner motor. Once an input is configured for 'SpinnerReverse' the following proportional outputs are automatically mapped:

Junction Box **V2-B** Spinner Forward
Junction Box **V2-A** Spinner Reverse

A digIn (Junction Box or CANIO board)



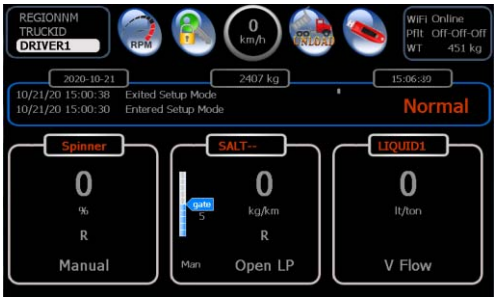
'**R**' – Forward, '**R**' - Reverse

3.3 Conveyor & Spinner Reverse

This feature supports bi-directional spinner operation. It requires two digital inputs to toggle the direction of the spinner and conveyor motors. Once an input is configured for 'SpinnerReverse' the following proportional outputs are automatically mapped:

Junction Box **V1-B** Conveyor Forward
Junction Box **V1-A** Conveyor Reverse
Junction Box **V2-B** Spinner Forward
Junction Box **V2-A** Spinner Reverse

2 digIn (Junction Box or CANIO board)

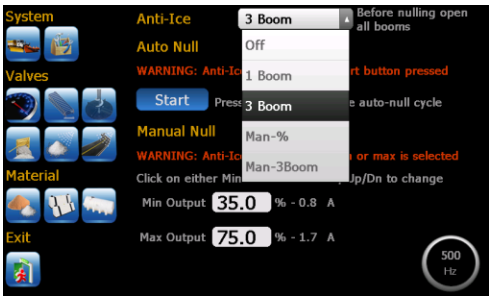


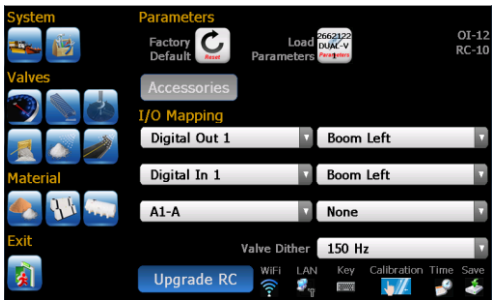
'**R**' – Forward, '**R**' - Reverse

3.4 3Boom Anti-ice (DLA)

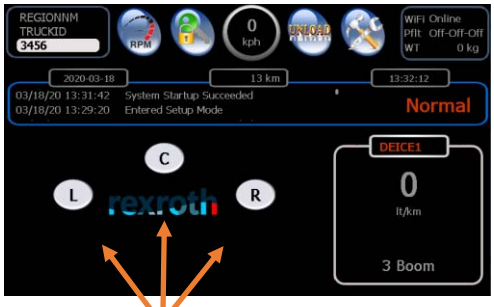
This configuration is a dedicated 3 Boom Anti-ice system. It requires 3 digital inputs (junction box or CANIO board) and 3 digital outputs for boom control.

To configure valve outputs it is highly recommended to use AUTONULL.





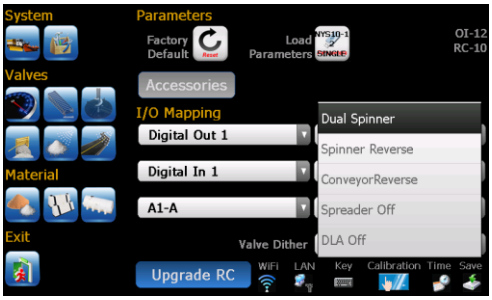
All booms must be open for nulling



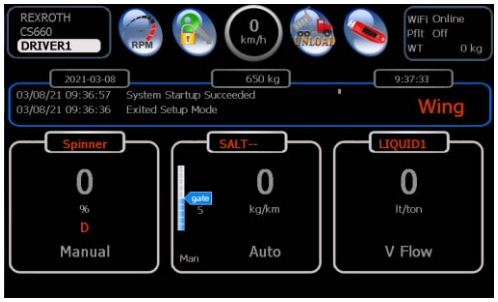
Button color is RED when boom is open 

3.5 Dual Spinner

This feature supports a single or dual spinner operation. It requires a digital input to switch on/off dual spinner function.



A digIn (Junction Box or CANIO board)

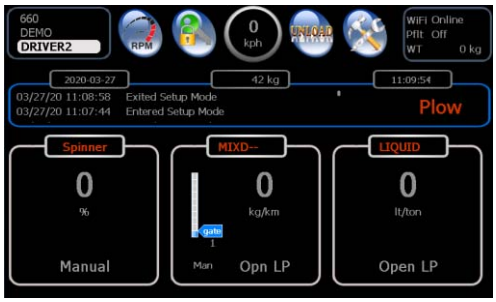


'**D**' – Single Spn, '**D**' – Dual Spn

3.6 Air Gate

This feature supports air gate operation. It requires a digital input to monitor the air cylinder position. When the input status changes the controller switch between 1st and 3rd solid and prewet materials, and also set operation gate position to calibrated gate position for the material selected.

A digIn (Junction Box or CANIO board)



Toggle 1st ←→ 3rd materials & calibrated gates

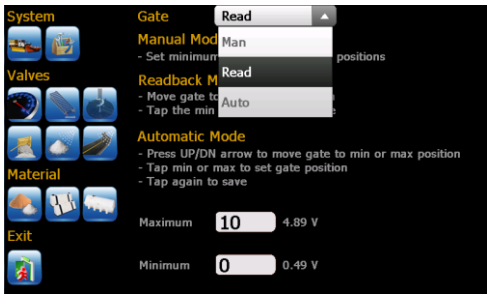
3.7 Gate Readback and Automatic Gate

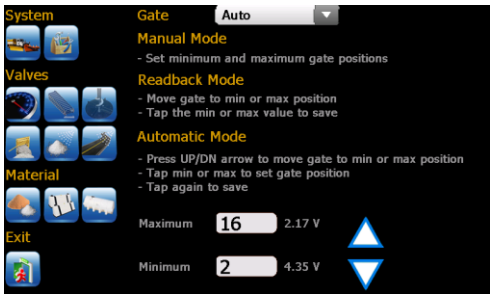
Gate Readback

It requires a gate sensor to measure the current gate position.
Sensor → A2-A (Junction box)

Automatic Gate

It requires a gate cylinder with a sensor to measure the gate position.
Sensor → A2-A (Junction box)





Steps to set up
- Move gate to max opening
- Press Max value to highlight
- Record sensor position
- Set max gate height
- Press Max value again to save

- Move gate to min opening
- Press Min value to highlight
- Record sensor position
- Set min gate height
- Press Min value gain to save

Steps to set up
- Up/Dn to move gate to max
- Move gate to max opening
- Press Max value to highlight
- Record sensor position
- Set max gate height
- Press Max value again to save

- Up/Dn to move gate to min
- Move gate to min opening
- Press Min value to highlight
- Record sensor position
- Set min gate height
- Press Min value gain to save

3.8 Lane Control

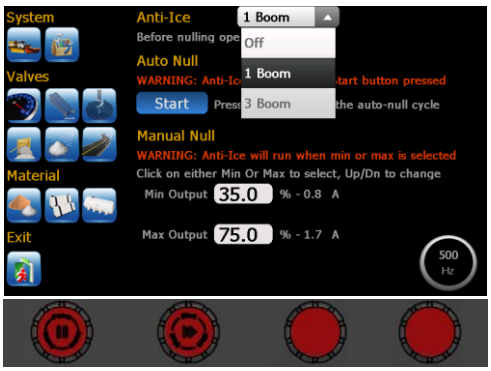
The conveyor and spinner motor sizes and flow rates should be chosen as to limit the number of lanes the system can actually cover before lane calibration takes place.

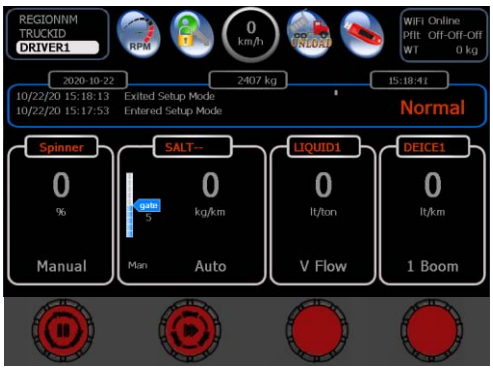
1. Tap on the “spinner” icon to enter into spinner menu, and select “Half Lane” or “One Lane”
2. Press “Start” Button.
3. Spinner will begin to output, and arrows will appear to allow you to increase/decrease the speed. You may also turn the center knob to activate the conveyor.
4. Use the arrows to set the desired speed to spread material to half lane or one lane width.

5. Press “Stop” to end the calibration and save calibration value.

3.9 (4 knob) Spreader + 1Boom Anti-ice

This configuration utilizes a 4 knob console, and control a spreader (spinner, conveyor, prewet) and a 1boom anti-ice simultaneously.

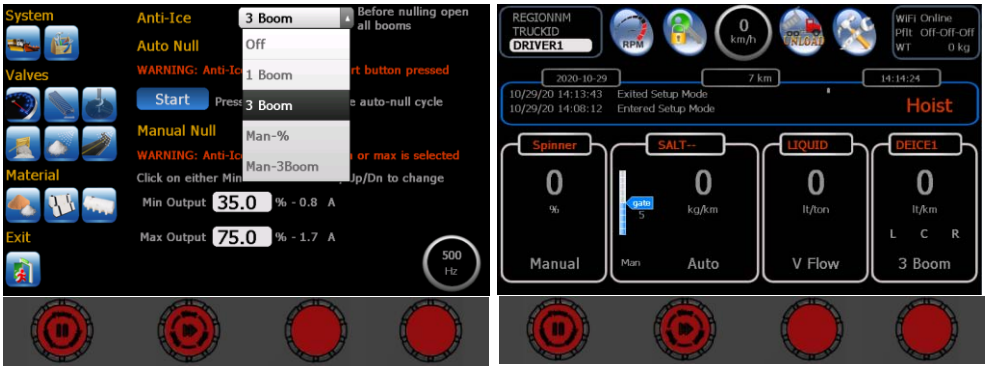




3.10 (4 knob) Spreader + 3Boom Anti-ice

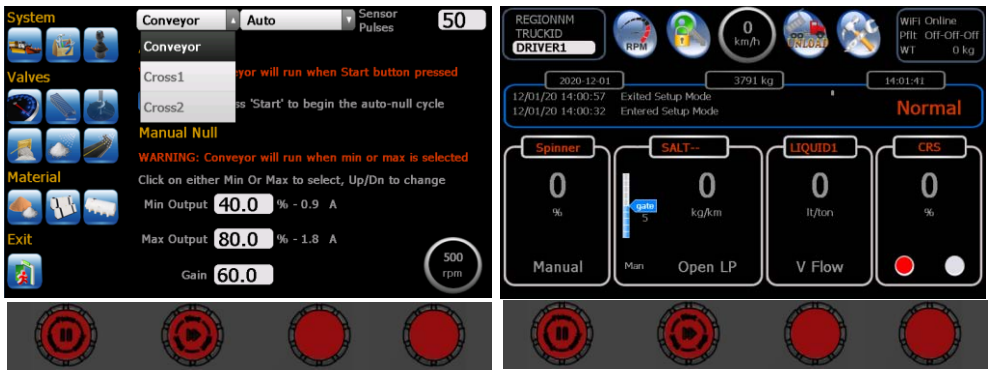
This configuration utilizes a 4 knob console, and controls a spreader (spinner, conveyor, prewet) and a 3boom anti-ice simultaneously. It requires 3 digital inputs (junction box or CANIO board) and 3 digital outputs for boom control.

To configure valve outputs it is highly recommended to use AUTONULL functions with sensors.



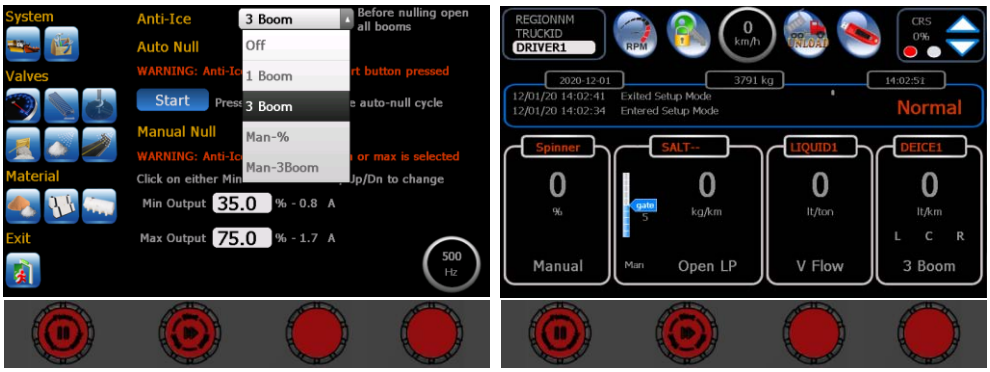
3.11 (4 knob) Spreader + Cross Conveyor

This configuration utilizes a 4 knob console, and controls a spreader and a cross conveyor simultaneously. It requires a digital input to switch cross conveyor direction (Left ←→ Right).



3.12 (4 knob) Spreader + 3Boom Anti-ice + Cross Conveyor

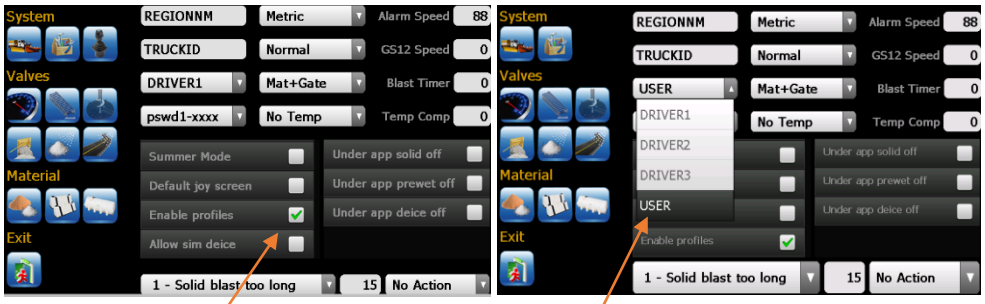
This configuration utilizes a 4 knob console, and controls a spreader + a cross conveyor + 3boom anti-ice systems simultaneously. It requires 4 digital inputs for controlling booms and cross conveyor direction.



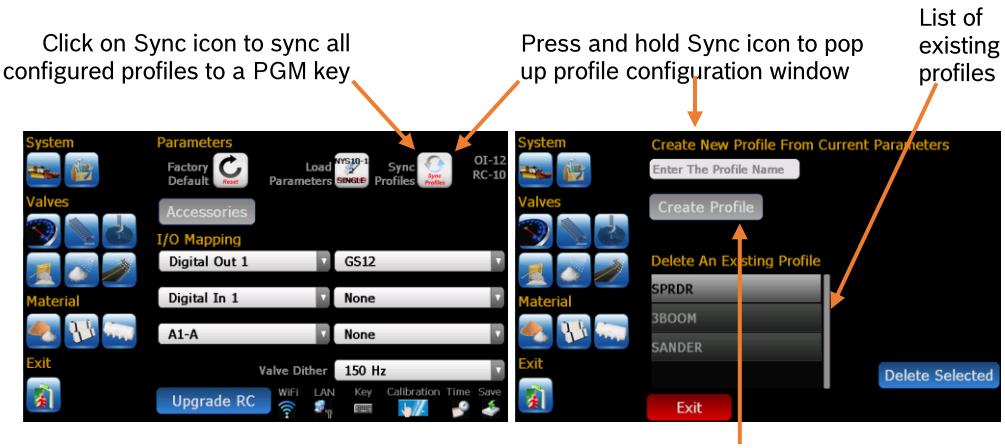
4 Set up Profiles

Profiles allow the operator quick selection of different system configurations. One example could be a profile called “Standard” used for typical spreading operation and another called “DLA” for dedicated anti-icing applications. These are only examples and any configuration made in settings can be saved as a profile.

STEP 1 Check ‘Enable profiles’, and set 4th Driver to ‘USER’ (see screens below).

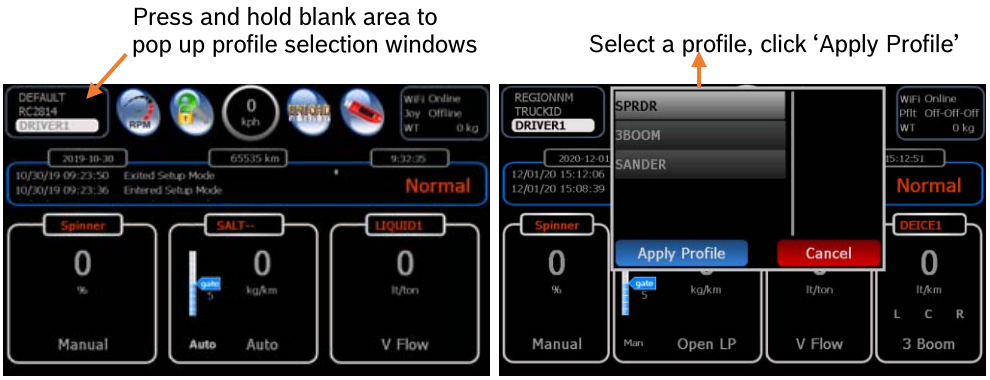


STEP 2 Press the toobox icon  to display all additional system options.



Note: Set system up as desired before creating profile

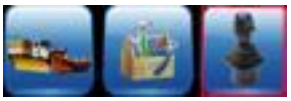
Operator can select a profile on operator screen without a PGM key when the vehicle isstationary.



5 Set up Joystick Operation

A typical spreader system with joystick option consists of the following components:

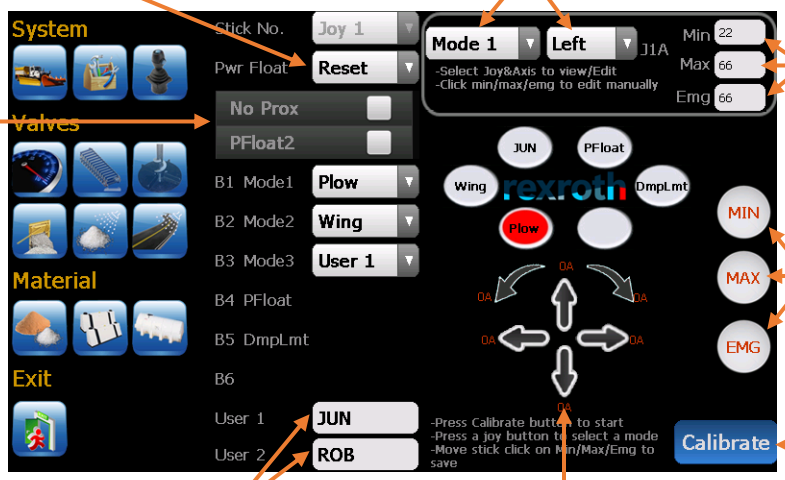
Once the joystick function is configured the joystick icon would be displayed under **SYSTEM**:



Click on the icon to pop up joystick configuration screen to calibrate all modes and axis configured.

Disable–power float OFF
Reset–Pfloat needs to be re-activated once the output is OFF.
Non Rst – Pfloat automatically re-activated once stick returns to neutral.

OPTION LIST
No Prox–No prox sensor
PFloat2 –2nd P.flt On/Off
DmpLmt–On/Off
Emg Interlock– Puts conveyor in pause once EMG button is pressed pushed
Msg Flash – Flash message when dump limit prox is triggered
Msg Rst – Message disappears once acknowledged till it is triggered again
Msg Off – Msg disabled



Solenoid Nulling

1. Press “Calibration” button and press a mode button on the joystick to select a desired mode to adjust.
4. Deflect joystick slowly until the hydraulic actuator moves – press “Min” while the stick is deflected.
5. Move the joystick until the actuator moves at a safe maximum speed – press “Max”.
6. Repeat this for all axis’, directions and modes.
7. While in calibration users also have option to double click on any direction arrow to pop up fine tuning screen, or click on “Stop” button again to save all changes.

6 Set Up Error Messages

Error Messages	#	Suggested Solution
01-BLAST TOO LONG	1	Blast held too long
02-LIQ BLST TOO LONG	2	Liquid blast held too long
03-OVER SPEED	3	Slow down, reset max speed
04-ERR SPN OUTPUT	4	Check cables, check coil
05-ERR CONV OUTPUT	5	Check cables, check coil
06-ERR CRS1 OUTPUT	6	Check cables, replace coil
07-ERR CRS2 OUTPUT	7	Check cables, replace coil
08-NO GRANULAR DET	8	Load material, check sensor
09-NO LIQUID DET	9	Load material, check sensor
10-NO GROUND SPEED	10	Check cable/sensor
11-NO CONV FEEDBACK	11	Check cable/sensor
12-NO WET FEEDBACK	12	Check cable/sensor
13-NO LIQ FEEDBACK	13	Check cable/sensor

Warning Messages	#	Suggested Solution
21-UNLOAD NOT ALLOWED	21	Vehicle needs to be stationary
22-SYSTEM ERROR !!!	22	Reboot, or re-flash
23-NO RC,CHK FUSE/CONNECTION	23	Comm failure between display and RC
24-LIQUID BOOM OPERATION ERROR	24	Need at least one boom to work
25-NO JOY1,CHK CONNECTION	25	Comm failure between RC and Joy 1
26-NO JOY2,CHK CONNECTION	26	Comm failure between RC and Joy 2
27-NO GATE POS SENSOR	27	Check gate sensor, cable break
28-GATE CLOSED	28	Gate closed in READBACK mode
29-NO SIMULATE	29	Speed Simulation mode stopped
30-SPN UNDER APP	30	Spinner not able to reach desired RPM
31-SOLID UNDER APP	31	Rate or spd too hi, incorrect calib
32-PREWET UNDER APP	32	Rate or spd too hi, incorrect calib
33-LIQ UNDER APP	33	Rate or spd too hi, incorrect calib
37-GND SPD CALIBRATION	37	Too few or no pulses, recalibrate
38-SPINNER CALIBRATION	38	Bad or no sensor
39-CONVEYOR CALIBRATION	39	Bad or no sensor
40-PREWET CALIBRATION	40	Too few pulses, or sensor failed
41-LIQ CALIBRATION	41	Too few pulses, or sensor failed
42-SPN CAL: WRONG CTRL MODE	42	Auto null not allowed for MAN mode
43-CNV CAL:WRONG CTRL MODE	43	Auto-null or calibration not allowed
44-PREWET CAL:WRONG CTRL MODE	44	Auto-null or calibration not allowed
45-LIQ CAL:WRONG CTRL MODE	45	Check Anti-icing or CrsCnv modes
46-CRS CNV CAL:WRONG MODE	46	Check Cross-Conv mode setting
47-CALIBRATION ERROR	47	Check sensor, recalibrate
48-CALIBRATION ERROR	48	Check sensor, recalibrate
xx-CALIBRATION ERROR	49 • • 70	Check sensor, recalibrate

The following Errors are warning messages, and not user configurable.

Error 21 – Unload Not Allowed. Vehicle needs to be stationary to activate UNLOAD function.

Error 22 - System Error. This can be caused by loading a wrong parameter file or wrong firmware file. Default and reboot, or re-flash the RC to see if it clears the error, otherwise report to Bosch Rexroth.

Error 23 - Communication failure between the RC controller and the display. Check display fuse and inspect all CANbus connections.

Error 24 – All booms are closed. Need at least one boom open to run liquid pump.

Error 25 - Joystick 1 communication failure. This will shut down the joystick outputs. Check if joystick connection inside the armrest is loose, otherwise report to Bosch Rexroth.

Error 26 - Joystick 2 communication failure. This will shut down the joystick outputs. Check if joystick connection inside the armrest is loose, otherwise report to Bosch Rexroth.

Error 27 - No Gate Sensor. Gate sensor failure, most likely caused by cable break. This will force the gate control into Manual.

Error 28 - Gate Position is Zero. This will occur only if the gate position is zero while in gate Read-back and Automatic gate modes. The conveyor will not be allowed to move until the gate is detected open.

Error 29 - No Ground Speed Simulation. This is just an information message to indicate that ground speed simulation mode has been stopped.

Error 30 – Spinner Under Application. Desired RPM can not be achieved. Check spinner min/max outputs and recalibrate spread width.

Error 31 – Solid Under Application. Desired RPM can not be achieved. Possibly caused by too high application rate or too high ground speed or incorrect calibration.

Error 32 – Prewet Under Application. Desired Pre-wet flow can not be achieved. Caused by too high application rate or too high ground speed or incorrect calibration.

Error 33 – Liquid Under Application. The anti-ice pump cannot meet the desired flow setpoint. Caused by too high application rate or too high ground speed or incorrect calibration.

Error 37 – Ground Speed Calibration. Pulses Too Low. Calculated pulses per km is too low during calibration. Possibly caused by no sensor feedback, or try recalibrating the ground speed sensor.

Error 38 - Spinner Calibration Error. During auto nulling, the calculated maximum RPM was too low, most likely caused by no sensor feedback.

Error 39 - Conveyor Calibration Error. During auto nulling, the calculated maximum RPM was too low, most likely caused by no sensor feedback.

Error 40 - Pre-Wet Maximum Hz Too Low. During auto nulling, the calculated maximum Hz was too low, most likely caused by no sensor feedback.

Error 41 – Liquid Calibration Error. During auto nulling, the calculated maximum Hz was too low, most likely caused by no sensor feedback.

Error 42 – Spinner Wrong Control Mode, Auto-Null not allowed

Error 43 – Conveyor Wrong Control Mode, Auto-Null not allowed

Error 44 – Prewet Wrong Control Mode, Auto-Null not allowed

Error 45 – Liquid Wrong Control Mode, Auto-Null not allowed

Error 47 – 70 Calibration Error. Check sensor or cable, recalibrate

7 Load or Retrieve Parameters and Clear Historical Error Messages

The operation requires an USB PROGRAM key. It allows users to load parameters from an existing parameter file on the USB stick.

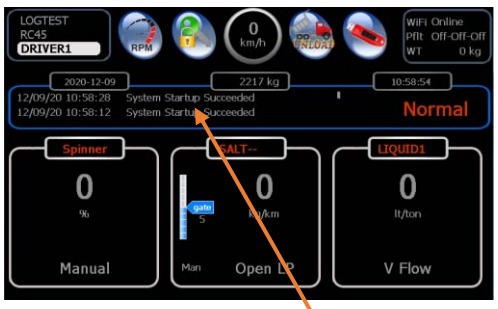
Load and Retrieve parameters

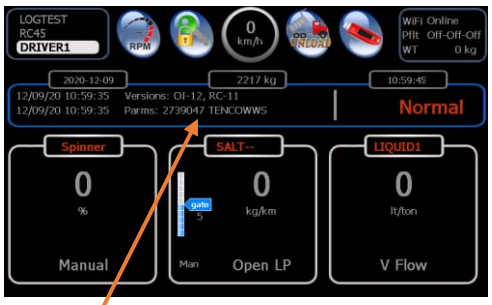
1. Tap on toolbox icon  to pop up tool window in PROGRAM mode
2. Tap on Load Parameters
3. Select a file from the popup file window to load
4. Click on the “Select” or “Cancel” button to select or cancel
5. With joystick option users would be given option to keep existing joystick setup
6. Tap “OK” to reboot
7. Turn the unit off, and on again for the new parameters to take effect

To retrieve the parameters click on usb icon  on the operator screen with a PGM key inserted.

Clear Historic Error Messages

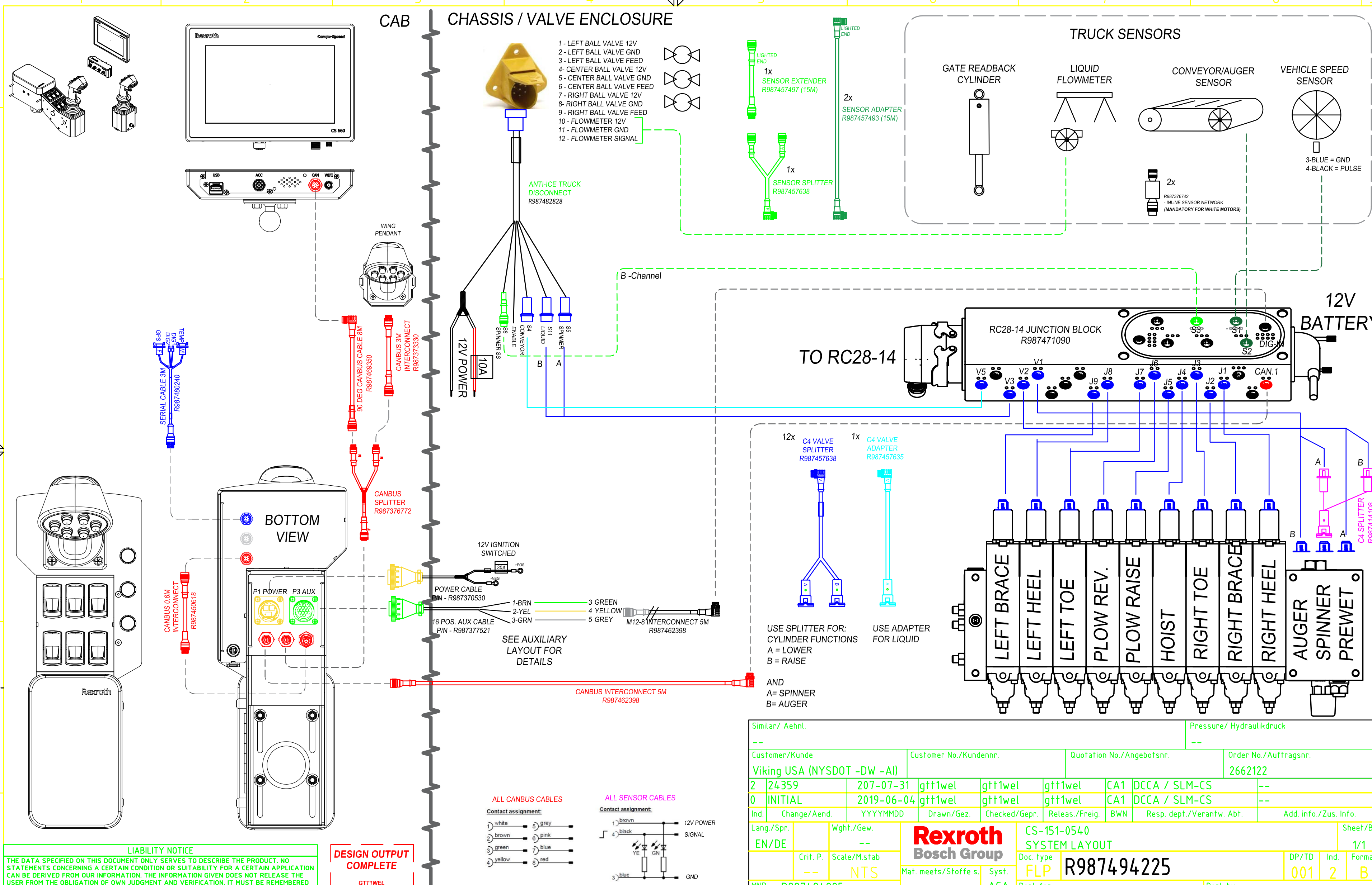
With a PROGRAM key users can also clear all the historic error messages on operator screen.





Press & hold anywhere in msgbox to clear

Bottom of the screen shows firmware versions and parameter file last loaded



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DESIGN OUTPUT COMPLETE
GTT1WEL

Similar/ Aehnl.				Pressure/ Hydraulikdruck			
--				--			
Customer/Kunde		Customer No./Kundennr.	Quotation No./Angebotsnr.	Order No./Auftragsnr.			
Viking USA (NYSDOT -DW -AI)				2662122			

Ind.	Change/Aend.	YYYYMMDD	Drawn/Gez.	Checked/Gepr.	Releas./Freig.	BWN	Resp. dept./Verantw. Abt.	Add. info./Zus. Info.
2	24359	207-07-31	gtt1wel	gtt1wel	gtt1wel	CA1	DCCA / SLM-CS	--
0	INITIAL	2019-06-04	gtt1wel	gtt1wel	gtt1wel	CA1	DCCA / SLM-CS	--

Lang./Spr.: EN/DE	Wght./Gew.: --	Crit. P.: --
Scale/M.stab: NTS	Mat. meets/Stoffe s.:	Syst.: ACA
MNR: R987494225	Doc. type: FLP	Repl. for: --
Repl. by: --	DP/TD: 001	Ind.: 2
Format: B	Sheet/Bl.: 1/1	

Rexroth
Bosch Group

CS-151-0540
SYSTEM LAYOUT

R987494225

CS-661
R987459408

CS-660
3 DIAL - R987457372
4 DIAL - R987457382

1" RAM BALL MOUNT R987454095
1" RAM: 5.25" BRACKET ARM R987454096
1" RAM: 3" BRACKET ARM R987454591

90 DEG CANBUS EXTENSION 8M
R987469350

OR

USE SPLITTER AND EXTENSION FOR REMOTE DISPLAY

CS-CAN-CM 660
3 DIAL - R987457375
4 DIAL - R987457383

CANBUS SPLITTER
R987376772

OR

Fuse 1/4" x 1.25" 2AG glass fuse (2.5A)
R911386828

OR

SERIAL CABLE
R987376776

1.5" RAM BASE + ARM 3" LONG R987376774
1.5" RAM ARM 6" LONG R987376786
1.5" RAM ARM 8" LONG R987465887
1.5" RAM BASE ONLY R987461421

ROAD TEMP. SENSOR

THIRD PARTY AVL MODULE

GNSS GPS RECIEVER
R913067839

CANBUS INTERCONNECT
R987462397 (3M)
R987462398 (5M)
R987462399 (10M)

CAB CONTROLS

WIFI ANTENNA
R987375239

ANTENNA EXTENSION (3M)
R987376088

CHASSIS / VALVE ENCLOSURE

SENSOR EXTENDER
R987457494 (3M)
R987457495 (5M)
R987457496 (10M)
R987457497 (15M)

USE SPLITTER FOR SENSORS THAT SHARE A PORT:
- CONV. + SPIN
- LIQUID + ANTI-ICE

SENSOR SPLITTER
R987457638

SENSOR ADAPTER
R987458928 (1M)
R987457490 (3M)
R987457491 (5M)
R987457492 (10M)
R987457493 (15M)

HYD. OIL FLOAT LEVEL SWITCH

HYD. PRESS/TEMP SENSOR
R901341687

TO RC 4-5

POWER

CAN.1

C4 VALVE SPLITTER
R987457638 (1M)
R987497697 (2M)
R987497700 (3M)
R987497701 (5M)

USE SPLITTER FOR FUNCTIONS THAT SHARE A PORT :
- SPIN+CONV.
- PREWET+ANTI.
- GATE RSE/LOW

C4 VALVE ADAPTER
R987457635 (1M)
R987497672 (2M)
R987497673 (3M)
R987497696 (5M)

USE ADAPTER FOR :
- PREWET ONLY
- ANTI-ICE ONLY

GATE
ANTI-ICE
PRE-WET
SPINNER
CONVEYOR

The valve graphic is intended for illustration and orientation purposes only. The actual valve may be arranged differently

TRUCK SENSORS

GATE READBACK CYLINDER

LIQUID FLOWMETER

A-PREWET
B- ANTI-ICE

CONVEYOR/AUGER SENSOR

SPINNER SENSOR

M12 PULL-UP ADAPTER
R987482879

VEHICLE SPEED SENSOR

3-BLUE = GND
4-BLACK = PULSE

M12 VEHICLE SPEED CABLE
R987498414

STANDARD PORT ASSIGNMENTS

S1-A	Gnd Speed
S2-B	Spn SS
S2-A	Conv Speed
S3-A	Liq/lvl
S3-B	Deice/lvl
A2-A	GateRdbk
A2-B	Option(wet/liq,...)
A1-B	Temperature
A1-A	Pressure
A3-A	Low oil
A3-B	Oil Temp
V1-B	Conv output
V1-A	Spin output
V2-B	Prewet
V2-A	Deice
V3-B	Op1(L-3boom)
V3-A	Op2(C-3boom)
V4-B	Gate Up
V4-A	Gate own
V5-B	Op3(R-3boom)
V5-A	LEDop(50mA)

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Similar/ Aehnl.: --
Pressure/ Hydraulikdruck: --
Customer/Kunde: DCNA Compu Spread
Customer No./Kundennr.:
Quotation No./Angebotsnr.:
Order No./Auftragsnr.: N/A

Ind.	Change/Aend.	YYYYMMDD	Drawn/Gez.	Checked/Gepr.	Releas./Freig.	BWN	Resp. dept./Verantw. Abt.	Add. info./Zus. Info.
1		July29_20	GTT1WEL	GTT1WEL	GTT1WEL	CA1	DCCA / SLM-CS	--
0	INITIAL	July29_20	GTT1WEL	GTT1WEL	GTT1WEL	CA1	DCCA / SLM-CS	--

Lang./Spr.: EN/DE
Wght./Gew.: --
Crit. P.: --
Scale/M.stab: NTS
MNR: 660/661 System
Mat. meets/Stoffe s.: 2510761
Syst.: ACA

Rexroth Bosch Group

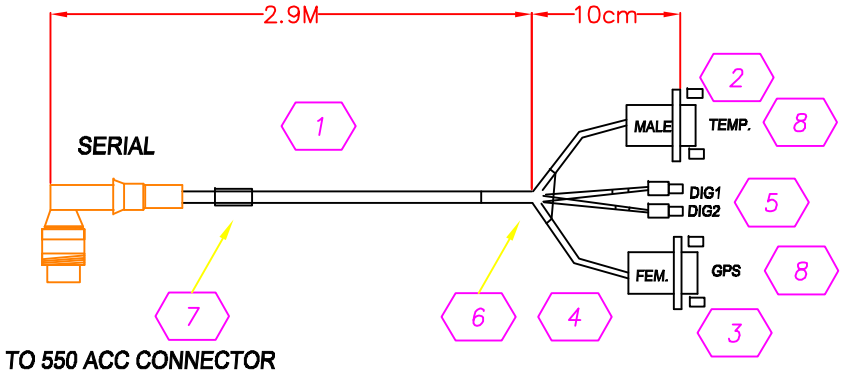
CS-660 / 661
SYSTEM CABLE LAYOUT
Sheet/Bl.: 1/1

Doc. type: FLP
Spreader System Layout
DP/TD: 001
Ind.: 5
Format: B

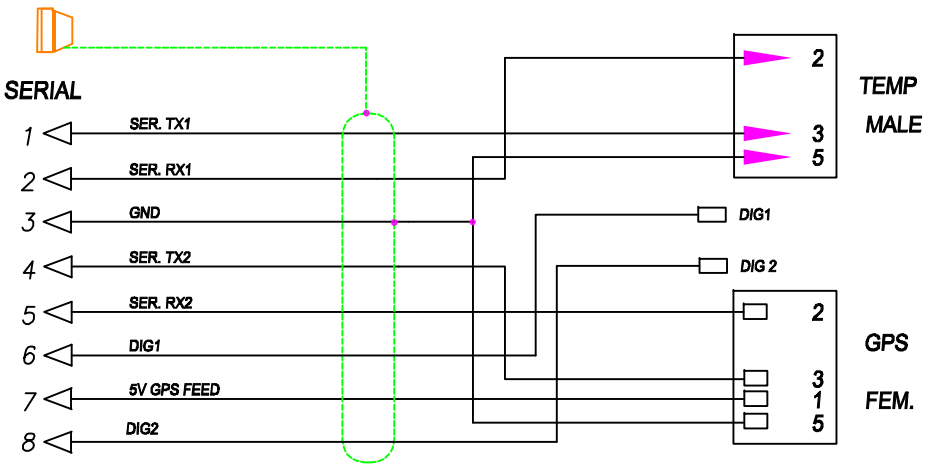
Repl. for --
Repl. by --

BILL OF MATERIAL

ITEM	QTY.	DESCRIPTION
1	1	MALE. M12 8 POS. 90deg 3M- CONEC P/N- 43-18885
2	1	DB-9 MALE - AMP P/N - 747043-4
3	1	DB-9 FEMALE - AMP P/N - 747318-4
4	5	LABEL LEG AS PER DRAWING
5	2	1/4" FEMALE QC
6	AS REQ.	ADHEASIVE HEATSHRINK
7	1	LABEL: 550 SERIAL P/N R987376776, DATE, TESTED
8	4	COUPLING NUT: DIGI-KEY - 160-000-006R032
		THREAD NUTS ONTO LOCKING SCREWS
	R6	COUPLING NUT: DIGI-KEY - 160-000-006R032



TO 550 ACC CONNECTOR
ON THE BOTTOM LEFT OF THE CONTROLLER



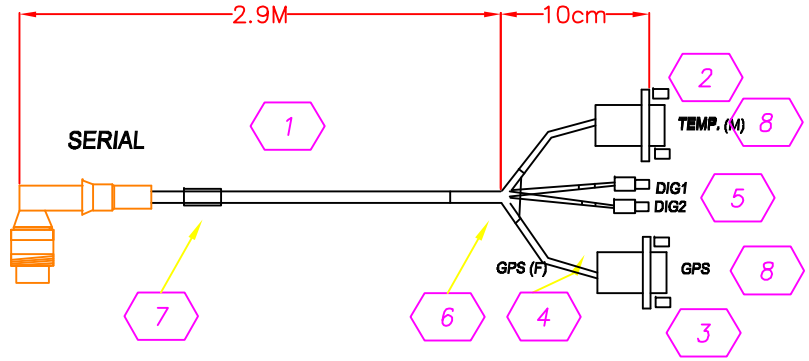
DRAWN BY:	T.G	FEB_1/10	SHEET SIZE: A
CHECKED BY:	T.G	MAR8_11	
DESIGN ENG.:	T.G	FEB_1/10	REV.: 6
CUSTOMER:	BOSCH REXROTH		
SCALE:	SCALE	DRAWING NO.:	R987376776_R5

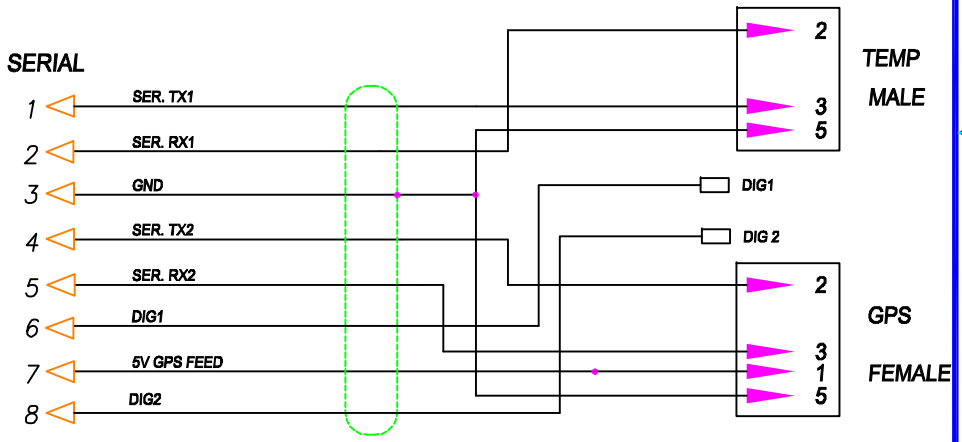
Rexroth
Bosch Group

550_SERIAL
P/N-279162_R987376776

BILL OF MATERIAL

ITEM	QTY.	DESCRIPTION
1	1	MALE. M12 8 POS. 3M 90deg– CONEC P/N– 43–18885
2	1	DB–9 MALE – AMP P/N – 747043–4
3	1	DB–9 FEMALE – AMP P/N – 747318–4
4	5	LABEL LEG AS PER DRAWING
5	2	1/4" FEMALE QC
6	AS REQ.	ADHEASIVE HEATSHRINK
7	1	LABEL:550 SERIAL(NULL) P/N R987400008, DATE, TESTED
8	4	COUPLING NUT: DIGI–KEY – 160–000–006R032
		THREAD NUTS ONTO LOCKING SCREWS
		SIMILAR TO 279162–PINS 2, 3 SWAPPED ON GPS LEAD
	R5	CONEC TINNED





DRAWN BY:	T.G	AUG22/12	SHEET SIZE: A
CHECKED BY:	T.G	AUG22/12	
DESIGN ENG.:	T.G	AUG22/12	REV.: 5
CUSTOMER:	BOSCH REXROTH		
SCALE:	SCALE	DRAWING NO.:	R987400008_R5

Rexroth
Bosch Group

550_SERIAL_NULL
P/N–R987400008