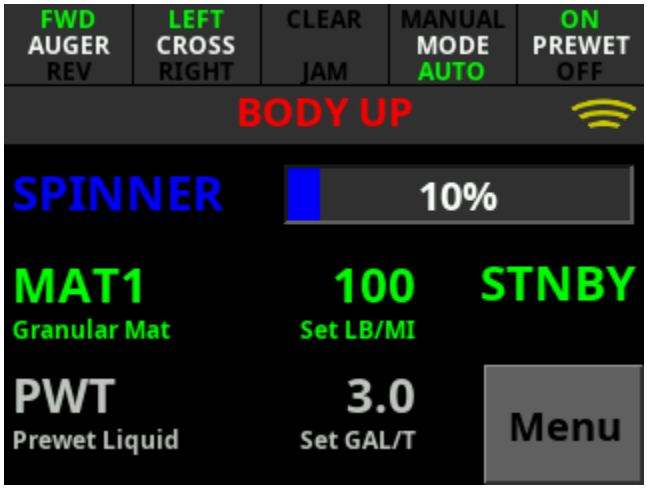
SSC5100ex Gen 2 Operation Manual



Firmware Version
2.3

FORCE® America INC.

Welcome

Congratulations on your purchase of a FORCE America®, Inc. SSC5100ex Spreader Control. This manual will guide you through the process of using your new spreader control.

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Hardware

The SSC5100ex is a self-contained spreader system. It has two rotary adjustment knobs, five pairs of “switches” that act as pushbuttons for SSC5100ex functions, and an interlock “switch” on the back of the controller. The functions that they control change depending on what options are enabled. See Switch Labels on page 3. The left side of the SSC5100ex has a single USB port, which can be used to import and export calibration files or upgrade the firmware.



Figure 1: The SSC5100ex Gen 2

When the SSC5100ex is used with the Patrol Commander Ultra or other joystick systems, optional remote controls can be used with the system to provide an additional point for control of the system. The remote controls provides the operator with three rotary adjustment knobs, up to five pairs of switches and inputs for remote activation of blast and standby.



5100 Operator Interface (PN 1101773) | 5150 Remote Control (PN 1103325) | 5150 JS (PN 1210240)

Figure 2: Remote Controls (Optional)

Powering up the SSC5100ex

Upon applying 12V DC dashkey power to the SSC5100ex, it will display the Screen Power Switch.

The Screen Power Switch

The Screen Power Switch is a safety feature of the SSC5100ex, it will prevent the system from running spreader related outputs until the Continue button is pressed. When the Continue button is pressed, it will display the Operation Screen.



Figure 3: Screen Power Switch

The Operation Screen

The Operation Screen is the main screen of the SSC5100ex, and provides controls for all of the system functions as well as access to the Menus.

The Operation Screen is divided into three distinct parts:

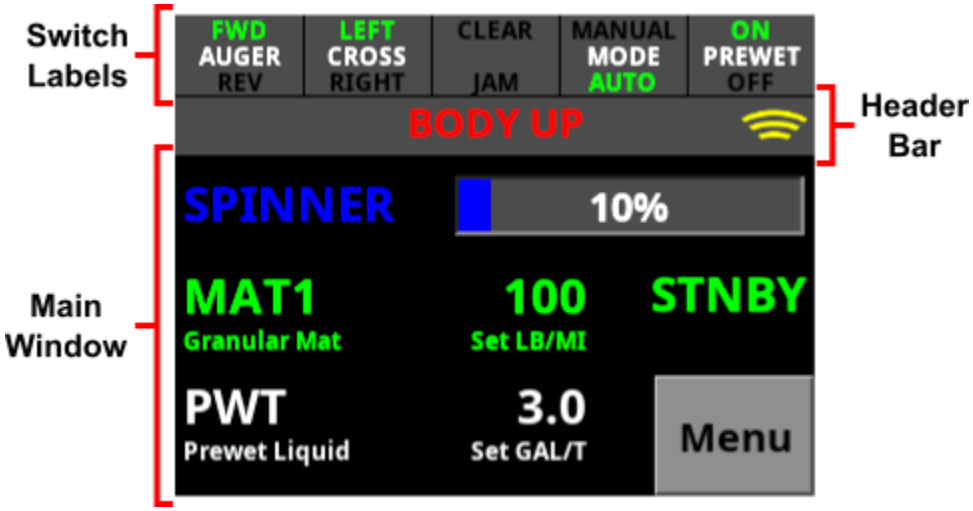


Figure 4: SSC5100ex Operation Screen

Switch Labels

The 5 Switch Labels always run across the very top of the screen. Each label corresponds to the switch directly above it. Active switch functions are indicated with a green color. If a switch is currently not used the label is left blank. The switch label will appear red if the operator selected the Disable option on the stuck switch error condition at startup. When in this state the affected function will not be able to be activated.

Switches can be pressed at any time during normal operation, whether the spreader is applying material or in standby. The optional 5150 mode replaces the functions of these switches with controls for a hoist and plow. See the section on 5150 mode for more information.

5100 Granular Mode



Figure 5: Switch Labels – 5100 Granular Mode

In Figure 5 above, Auger is running in the forward direction, Cross Auger in the left direction, Clear Jam is not running, Manual Mode is off, and Prewet is on.

Switch	Function	Availability Requires
FWD AUGER REV	Changes the active direction of the auger/conveyor (forward or backwards). Pressing the top switch will select forward and the bottom will select reverse.	Auger Reverse must be enabled in Calibration. The system must not be a 5150 or FORCE America ONE™ model.
LEFT CROSS RIGHT	Changes the active direction of the cross auger/conveyor (left or right). Pressing the top switch will select left (cross auger 1) and the bottom will select right (cross auger 2).	Cross Auger 1 and 2 must be enabled and set to the same parent function in Calibration. The system must not be a 5150 or FORCE America ONE™ model.
CLEAR JAM	Momentarily activates Clear Jam. Runs the main auger/conveyor at 100% in the opposite direction until the switch is released. Pressing either switch will activate Clear Jam.	Clear Jam must be enabled in Calibration. The system must not be a 5150 or FORCE America ONE™ model.
MANUAL MODE AUTO	Activates or deactivates Manual mode for both granular and prewet. Pressing the top switch will turn on Manual Mode and the bottom switch will turn it off. See page 6.	Granular Manual Mode must be enabled in Calibration.

Switch	Function	Availability Requires
ON PREWET OFF	Activates or deactivates the prewet output. Pressing the top switch will turn on Prewet and the bottom switch will turn it off. See page 6.	Prewet must be enabled in Calibration.

5100 Direct Mode



Figure 6: Switch Labels – 5100 Direct Mode

Switch	Function	Availability Requires
ON LEFT OFF	Opens the left lane ball valve for direct application. Pressing the top switch will select turn on the output, opening the valve and the bottom will select turn off the output closing the valve.	The Application mode in calibration must be Direct 3 Lane or Gran/Dir 3 Lane. The current mode must be set to Direct.
ON CENTER OFF	Opens the center lane ball valve for direct application. Pressing the top switch will select turn on the output, opening the valve and the bottom will select turn off the output closing the valve	The Application mode in calibration must be Direct 3 Lane or Gran/Dir 3 Lane. The current mode must be set to Direct.
ON RIGHT OFF	Opens the right lane ball valve for direct application. Pressing the top switch will select turn on the output, opening the valve and the bottom will select turn off the output closing the valve	The Application mode in calibration must be Direct 3 Lane or Gran/Dir 3 Lane. The current mode must be set to Direct.
MANUAL MODE AUTO	Activates or deactivates Manual mode for direct. Pressing the top switch will turn on Manual Mode and the bottom switch will turn it off. See page 10.	Direct Manual Mode must be enabled in Calibration.

Header Bar



Figure 7: Header Bar

The Header Bar always runs across the top of the screen just below the switch labels. It contains a series of system status messages and the PreCise™ MRM status icon (if Event Logging is set to PreCise).

System Status Messages will be displayed in the center of the Header Bar. If two or more system status messages are active, the messages will alternate between each other at a rate of one message every two seconds. In Figure 7 above, a Body Up condition has occurred, showing the Body Up system status message in the header bar.

The PreCise status icons will be displayed to the right of the system status messages. In Figure 7 above, a PreCise connection error has occurred, showing the PreCise connection error icon in the header bar.

For more information on error conditions, see Joystick Operation (5150 or FORCE America ONETM Systems Only)

Main Window

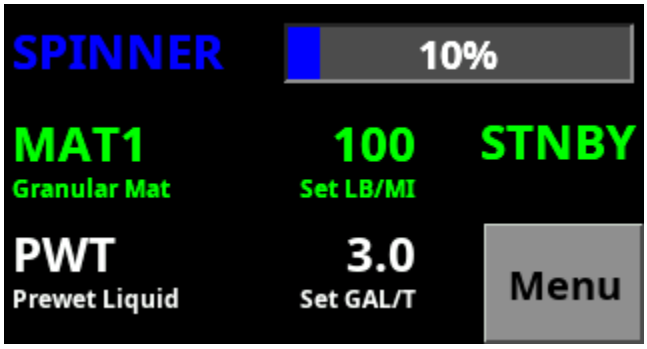


Figure 8: Main Window

The Main Window displays important information about the materials the system is spreading.

The blue spinner row contains information about your spinners set rate. The spinner row will only appear when applying granular materials and adjusted using the blue knob.

The green row contains information about your primary material, its set rate, and its actual output rate. It will display granular or direct information depending on which type of material you are applying. This row is always visible and adjusted using the green knob.

The white prewet row contains information about your prewet material, its set rate, and its actual output rate. The prewet row will only appear when applying granular materials and Prewet is enabled in Calibration. It is white when Prewet is activated and gray when Prewet is not activated.

Applying Material

When your SSC5100ex system starts up, it will always be in Standby, as shown in Figure 8. Standby deactivates all outputs. You will need to remove your system from Standby before it will apply material.

The spreader can apply granular material only (called Dry Granular Application), apply a prewet liquid to the granular material before spreading (Prewetted Granular Application), or apply liquid in one of three types (Anti-Ice, Dust Control, or Herbicide).

The SSC5100ex can apply materials in one of four modes:

Open-Loop Mode
Open-Loop Mode uses ground speed information from the vehicle's speedometer to spread material uniformly across its route. As the vehicle changes its speed the auger, prewet pump, or direct pump adjust their output to ensure steady material application. The system will automatically stop spreading material when the vehicle comes to a stop.

Closed-Loop Mode
Closed-Loop Mode is identical to open-loop mode, but uses an feedback sensor from the auger, prewet pump, or direct pump to monitor output rates. Materials spread in closed-loop mode are spread more accurately than in open-loop mode.

Manual Mode
Manual Mode does not vary its output rate with vehicle speed. Instead, granular, prewet liquid, or direct liquid material is applied at a constant rate. The auger, spinner, prewet pump, and direct pump will continue to run when the vehicle comes to a stop. Materials spread in manual mode are spread less accurately than in open-loop or closed-loop mode and require the operator to manually adjust the material rates as the vehicle speed varies.

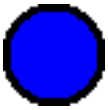
Gravity Feed Mode (Prewet Only)
Gravity Feed Mode, like Manual Mode, does not vary its output rate with vehicle speed. Instead prewet output is always run at 100% when it is on.

These modes do not have to match between subsystems, but prewet liquid can't be run in a more accurate mode than granular material. For example, you can run your auger in closed-loop mode and your prewet pump in open-loop mode, but you cannot run prewet in closed-loop mode if the auger is in open-loop mode. These options are available in the Calibration Menu.

If enabled in Calibration, Manual Mode is activated or deactivated using the fourth switch above the screen. Deactivating manual mode returns the subsystem to its previous mode, either closed-loop or open-loop mode.

All other actions on the SSC5100ex are activated using the switches and knobs on the front. The table below describes each button and its actions while on the Operation Screen.

Each rotary adjustment knob on the Operator Interface performs a different function when applying material. See the table below.

Input	Input	Function
Green On / Standby Knob 	Twist Left	Decrease the auger or direct set rate.
	Twist Right	Increase the auger or direct set rate.
	Pushbutton	Place the system in standby. Remove the system from standby.
Blue Blast Knob 	Twist Left	Decrease the spinner set rate.
	Twist Right	Increase the spinner set rate.
	Pushbutton	Blast granular material. Cancel Blast.



To reduce the risk of death or injury, ensure that all personnel are clear from moving machinery before activating outputs.

To spread granular material in closed-loop or open-loop mode:

STEP 1: Twist the On / Standby knob to adjust your granular set rate (pounds per mile or kilograms per kilometer).

STEP 2: Twist the Blast knob to adjust your spinner set rate.

STEP 3: Press the On / Standby knob to remove the spreader control from standby. Granular material will spread when the vehicle is moving.

STEP 4: Press the On / Standby knob to place the spreader control back in standby and stop the outputs.

To spread granular material in manual mode:

STEP 1: Press the top half of the switch labeled “MODE” above the screen to activate granular manual application. The switch’s MANUAL text will turn green when activated.

STEP 2: Twist the On / Standby knob to adjust your granular output percentage.

STEP 3: Twist the Blast knob to adjust your spinner set rate.

STEP 4: Press the On / Standby knob to remove the spreader control from standby. Granular material will spread regardless of whether the vehicle is moving or not.

STEP 5: Press the On / Standby knob to place the spreader control back in standby and stop the outputs.



Manual Mode needs to be enabled by a supervisor in calibration for it to be available on a switch.



To reduce the risk of death or injury, ensure that all personnel are clear from moving machinery before activating outputs.

To spread granular and prewet material in closed-loop or open-loop mode:

STEP 1: Press the top half of the switch labeled “Prewet” above the screen to enable prewet liquid application. The switch’s ON text will turn green when activated.

STEP 2: Twist the On / Standby knob to adjust your granular set rate (pounds per mile or kilograms per kilometer).

STEP 3: Twist the Blast knob to adjust your spinner set rate.

STEP 4: Press the button labeled Menu in the lower right-hand corner of the screen to enter the Main menu.

STEP 5: Press the button labeled Material to enter the Material menu.

STEP 6: Press the button labeled Prewet Rate to access the prewet set rate.

STEP 7: Press the left and right arrow buttons to adjust your prewet set rate (gallons per ton or liters per ton).

STEP 8: Press the Ok button to save the setting and return to the Material menu.

STEP 9: Press the Back button to return to the Main menu.

STEP 10: Press the Back button to return to the operation screen.

STEP 11: Press the On / Standby knob to remove the spreader control from standby. Granular and prewet material will spread when the vehicle is moving.

STEP 12: Press the On / Standby knob to place the spreader control back in standby and stop the outputs.

To spread granular material in closed-loop or open-loop mode with manual prewet:

STEP 1: Press the top half of the switch labeled “Prewet” above the screen to enable prewet liquid application. The switch’s ON text will turn green when activated.

STEP 2: Twist the On / Standby knob to adjust your granular set rate (pounds per mile or kilograms per kilometer).

STEP 3: Twist the Blast knob to adjust your spinner set rate.

STEP 4: Press the button labeled Menu in the lower right-hand corner of the screen to enter the Main menu.

STEP 5: Press the Material button to enter the Material menu.

STEP 6: Press the Prewet Manual button to access the prewet manual option.

STEP 7: Press the right arrow to set Prewet Manual to enabled.

STEP 8: Press the Ok button to save the setting and return to the Material Menu.

STEP 9: Press the button labeled Prewet Rate to access the prewet set rate.

STEP 10: Press the left and right arrow buttons to adjust your prewet output percentage.

STEP 11: Press the Ok button to save the setting and return to the Material menu.

STEP 12: Press the Back button to return to the Main menu.

STEP 13: Press the Back button to return to the operation screen.

STEP 14: Press the On / Standby knob to remove the spreader control from standby. Granular and prewet material will spread when the vehicle is moving.

STEP 15: Press the On / Standby knob to place the spreader control back in standby and stop the outputs.



To reduce the risk of death or injury, ensure that all personnel are clear from moving machinery before activating outputs.

To spread granular and prewet material in manual mode:

STEP 1: Press the top half of the switch labeled “Prewet” above the screen to enable prewet liquid application. The switch’s ON text will turn green when activated.

STEP 2: Press the top half of the switch labeled “MODE” above the screen to activate granular manual application. The switch’s MANUAL text will turn green when activated.

STEP 3: Twist the On / Standby knob to adjust your granular output percentage.

STEP 4: Twist the Blast knob to adjust your spinner set rate.

STEP 5: Press the button labeled Menu in the lower right-hand corner of the screen to enter the Main menu.

STEP 6: Press the button labeled Material to enter the Material menu.

STEP 7: Press the button labeled Prewet Rate to access the prewet set rate.

STEP 8: Press the left and right arrow buttons to adjust your prewet output percentage.

STEP 9: Press the Ok button to save the setting and return to the Material menu.

STEP 10: Press the Back button to return to the Main menu.

STEP 11: Press the Back button to return to the operation screen.

STEP 12: Press the On / Standby knob to remove the spreader control from standby. Granular and prewet material will spread regardless of whether the vehicle is moving or not.

STEP 13: Press the On / Standby knob to place the spreader control back in standby and stop the outputs.



Manual Mode needs to be enabled by a supervisor in calibration for it to be available on a switch.

To switch between granular and direct modes:

STEP 1: Press the button labeled Menu in the lower right-hand corner of the screen to enter the Main menu.

STEP 2: Press the button labeled More to view the second page of the main menu.

STEP 3: Press the Mode button to adjust the current application mode.

STEP 4: Press the left and right arrow buttons to switch between granular and direct application modes.

STEP 5: Press the Ok button to save the setting and return to the second page of the Main menu.

STEP 6: Press the Back button to return to the Main menu.

STEP 7: Press the Back button to return to the operation screen.



Granular/Direct Modes need to be enabled by a supervisor in calibration for it to be accessible in the main menu.



To reduce the risk of death or injury, ensure that all personnel are clear from moving machinery before activating outputs.

To spread direct material in closed-loop or open-loop mode:

STEP 1: Twist the On / Standby knob to adjust your direct set rate (spreading measurement units will vary with Direct Type).

STEP 2: Press the On / Standby knob to remove the spreader control from standby. Direct material will spread when the vehicle is moving.

STEP 3: Press the On / Standby knob to place the spreader control back in standby and stop the output.

To spread direct material in manual mode:

STEP 1: Press the top half of the switch labeled “MODE” above the screen to activate manual application. The switch’s MANUAL text will turn green when activated.

STEP 2: Twist the On / Standby knob to adjust your direct output percentage.

STEP 3: Press the On / Standby knob to remove the spreader control from standby. Direct material will spread regardless of whether the vehicle is moving or not.

STEP 4: Press the On / Standby knob to place the spreader control back in standby and stop the output.



Manual Mode needs to be enabled by a supervisor in calibration for it to be available on a switch.

Blast

Blast is a spreader feature that runs the granular or direct output (if enabled) at a set rate for a set amount of time. Usually it is configured to run at a high output setting in order to “Blast” a portion of road with extra material.

By default, Blast is set to spread Granular Material for ten seconds at 1000 pounds per mile or Direct Material for ten seconds at 65 gallons per mile.

When Blast is activated, the granular row will display the word “BLAST” instead of the material name. See Figure 9.

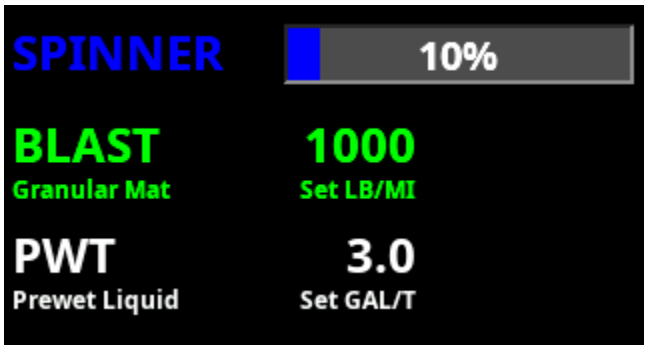


Figure 9: Granular / Prewet Application Mode in Blast

> To reduce the risk of death or injury, ensure that all personnel are clear from moving machinery before activating outputs.

To activate Blast:

STEP 1: Press the Blue Blast Knob on the Operator Interface. The system will blast for its configured amount of time or distance and return to normal operation. The Blast feature works whether or not the system is in Standby or the vehicle is moving.

To deactivate Blast before it automatically shuts off:

STEP 1: While the system is Blasting, press the Blue Blast Knob on the Operator Interface. The Blast feature will shut off and return to its previous operation (spreading or standby).

Entering Menus

The Menu button is the gateway for all menu navigation. With it, you can access the Material, Sim Speed, Calibration, and Data submenus. It also contains the options for unloading granular material and adjusting the backlight and plow float options.



The Menu button is not accessible except when the system is in Standby.

To open the Main menu:

STEP 1: Press the Menu button in the lower right corner of the screen.

The Main menu has the following sections in its menu tree. If there are more than five menu options in a given level they can be accessed by the Next button in the lower right corner of the screen. To return to the first five options after pressing the Next button press the Back button in the lower left corner of the screen.

Material (Granular Mode)
The Material menu allows you to select different granular materials, enable or disable prewet manual mode, change the prewet set rate, and set the prewet liquid remaining.

Gran Mat
The Gran Mat menu item will allow you to select different granular materials. Use the left and right arrow buttons on screen to select different mats. As with all options pressing Ok will save your selection and pressing Cancel will discard it. For a material to appear in the list it must be enabled by a supervisor in Calibration.

Prewet Set Rate
The Prewet Set Rate menu item will allow you to select the prewet set rate. Use the left and right arrow buttons on screen to adjust the setting. As with all options pressing Ok will save your selection and pressing Cancel will discard it. To access this menu item Prewet must be enabled by a supervisor in Calibration.

Prewet Manual
The Prewet Manual menu item will allow you to enable or disable prewet manual mode. Use the left and right arrow buttons on screen to adjust the setting. As with all options pressing Ok will save your selection and pressing Cancel will discard it. To access this menu item both Prewet and Prewet Manual must be enabled by a supervisor in Calibration.

Liquid Remaining
The Liquid Remaining menu item will allow you to set the amount of liquid remaining in the Prewet Tank. Use the up and down arrow buttons to increase or decrease the selected digit. Use the left and right arrow buttons to select different digits. Pressing a digit directly will also select it. The prewet liquid remaining can be set anywhere from 0 to the tank size set up by a supervisor in Calibration. As with all options pressing Ok will save your selection and pressing Cancel will discard it. To access this menu item both Prewet and Material Countdown must be enabled by a supervisor in Calibration.

Material (Direct Mode)
The Material menu allows you to set the liquid remaining in your tank.

Liquid Remaining
The Liquid Remaining menu item will allow you to set the amount of liquid remaining in the Direct Tank. Use the up and down arrow buttons to increase or decrease the selected digit. Use the left and right arrow buttons to select different digits. Pressing a digit directly will also select it. The direct liquid remaining can be set anywhere from 0 to the tank size set up by a supervisor in Calibration. Ok will save your selection and pressing Cancel will discard it. To access this menu item both Direct and Material Countdown must be enabled by a supervisor in Calibration.

Unload/Prime
The Unload/Prime menu allows you to unload granular or direct materials or prime the prewet pump.

Unload
The Unload menu item allows you to run the auger and spinner or direct pump to unload material while the system is stationary. See Unload on page 17 for more information. To access this menu item Unload mode must be enabled by a supervisor in Calibration.

Prewet Prime
The Prewet Prime menu item allows you to run the prewet pump to prime it for use while the system is stationary. See Prewet Prime on page 19 for more information. To access this menu item Prewet Prime must be enabled by a supervisor in Calibration.

Backlight
The Backlight menu item allows you to set the screen's brightness. Use the left and right arrow buttons on the screen to select between the different levels. Available options are Low, Medium, High, and Max. As with all options pressing OK will save your selection and pressing Cancel will discard it. The screen actual brightness will update when the OK button is pressed.

Plow Float
The Plow float menu item is used by 5150 or FORCE America ONE™ model. For more information see Using the optional Hoist and Plow Controls (5150 or FORCE America ONE™ Systems) on page 22.

Sim Speed
The Sim Speed menu allows you turn on Sim Speed as well as set the speed it is simulating while on the operation screen. To access this menu Sim Speed must be enabled by a supervisor in Calibration.

On/Off
The On/Off menu item will allow you to turn on and off Sim Speed. Use the left and right arrow buttons on the screen to select between the different options. As with all options pressing OK will save your selection and pressing Cancel will discard it.

Speed
The Speed menu item will allow you to set the speed Sim Speed will simulate when it is on. Use the up and down arrow buttons to increase or decrease the selected digit. Use the left and right arrow buttons to select different digits. Pressing a digit directly will also select it. The Sim Speed's speed can be set anywhere from 0 to 60 MPH or 0 to 99 KPH. As with all options pressing OK will save your selection and pressing Cancel will discard it.

Calibration
The Calibration menu contains all the various settings to configure the SSC5100ex for use. The supervisor password or key is required to access it. For more information see Manual M0152 – 5100ex Gen 2 Calibration Manual.

Data
The Data menu contains the SSC5100ex usage related interaction items, hardware and firmware info and diagnostic items.

Version
The Version menu allows you to view the system's hardware and firmware info.

Firmware
The Firmware menu item will allow you to view the current firmware version.

Serial Number
The Serial Number menu item will allow you to view the spreader's serial number.

Hardware Rev
The Hardware Rev menu item will allow you to view the hardware revision.

Screen Rev
The Screen Rev menu item will allow you to view the LCD screen revision.

Boot Loader Rev
The Boot Load Rev menu item will allow you to view the boot loader revision.

Model
The Model menu item will allow you to view the model type, either Standard, 5150, FORCE America ONE™, or DLAVAR.

Remote Controls
The Remote Controls menu serves as a status indicator for the optional remote controls and will indicate one of three possible states.

Status	Description
Not Connected	The 5100ex is not currently communicating with the remote controls, changing the dials and switches on the remote control will have no effect on the 5100ex settings.
Connected	The 5100ex is currently communicating with the remote controls and changing the dials and switches on the remote controls will affect the operation of the system.

Totals
The Totals menu allows you to view, export, and clear material totals.

View
The View menu will allow you to view material totals.

Material 1, Material 2, Material 3, Material 4, Prewet Material
The Material menu item will allow you to view the time, distance, and displacement for the selected material. If the time, distance or displacement exceeds its maximum value it will begin counting again from 0. The maximum values are shown in the table below.

	English	Metric
Application Time	999:59:59	999:59:99
Application Distance	999,999.9 MI	999,999.9 KM
Gran Application Displacement	9,999,999.9 LBS	9,999,999.9 KGS
Prewet Application Displacement	999,999.9 GAL	999,999.9 L
Anti-Ice Displacement	999,999.9 GAL	999,999.9 L
Dust Control Displacement	999,999.9 GAL	999,999.9 L
Herbicide Displacement	999,999.9 GAL	999,999.9 L

System
The System menu item will allow you to view system time (how long the spreader has been on) and system distance (the total distance the system has moved while on). If either exceeds its maximum value it will begin counting again from 0. The maximum values are shown in the table below.

	English	Metric
System Time	9999:59:59	9999:59:99
System Distance	999,999.9 MI	999,999.9 KM

Export
The Export menu item will allow you to export the time, distance, and displacement for all materials as a txt file to a USB drive.

Clear
The Clear menu item will allow you to clear the time, distance, and displacement of all the material totals. To clear material totals you must either enter the Clear Code setup by a supervisor in Calibration or use a Supervisor Key.

Inputs
The Inputs menu allows for a diagnostic view of the spreader switch states and the external input states. The color of the text that corresponds to the spreader related switch or external input changes to reflect the state of the input.

When the spreader switch state is detected as inactive the switch text will be white. The text will change to green when the switch is detected as active.

The external input text will be white to indicate when the related external input is inactive, and will change to green when that external input is active. The voltage level detected for the external inputs will also be indicated on the screen for inputs 1, 2, 3, 5 & 6. These inputs are grounding inputs so that when the voltage level is at ground, 0 Volts, the input will be interpreted as being active.

Diagnostic
The Diagnostic menu item allows you to enter diagnostic mode. In diagnostic mode more information about the various outputs is displayed. See Diagnostic Mode on Page 42 for more information

Errors
The Errors menu allows you to view, export, and clear the error log. The error log contains the last 100 errors that have occurred, along with the system time of the occurrence. When more than 100 errors have occurred the system will replace the oldest error with new information. For information related to the cause and possible resolution of the errors see the Troubleshooting and Error Conditions on page 24.

View
The View menu will allow you to view the logged errors and the system time at which the error occurred. The most recent errors are displayed first. The arrow keys can be used to navigate to the next and previous pages.

Export
The Export menu item will allow you to export the logged error information to a USB drive. The entered storage name will be appended with ERROR_LOG.txt to create the full file name.

Clear
The Clear menu item will allow you to clear the error log. To clear the error log you must either enter the Clear Code, which is the same as the Calibration Access Code or use a Supervisor Key.

Mode

The Mode menu item allows you to switch between Granular and Direct application. To access this menu item, Application Mode must be set to Gran/Dir 1 Lane, or Gran/Dir 3 Lane by a supervisor in Calibration. The direct liquid type either is set to a particular mode in Calibration, or can be adjusted using the Direct Type menu below.

Direct Type

The Direct Type menu item allows you to choose the type of direct liquid to apply. The supported liquid types are Anti-Ice, Dust Control, and Herbicide. To access this menu item, Application Mode must be set to Gran/Dir 1 Lane, or Gran/Dir 3 Lane and the Direct Type must be set to User-Selected by a supervisor in Calibration.

Unload

The Unload menu item allows you to unload granular or direct liquid materials from the vehicle. The Unload menu item is not accessible unless it has been enabled by a supervisor in calibration. When the Unload menu item is selected the screen shall look like Figure 10 below.

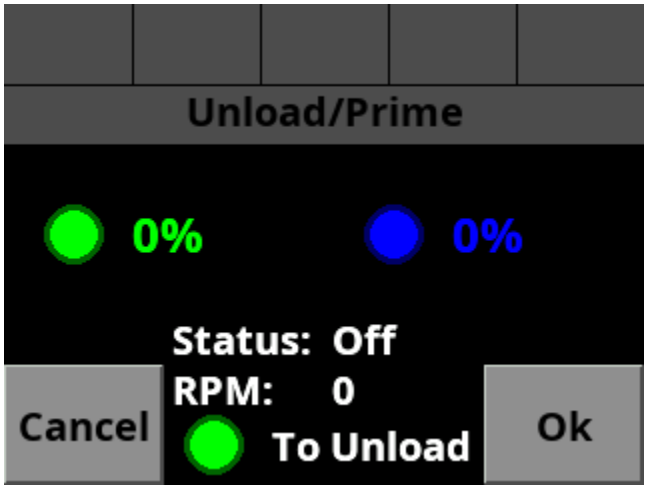
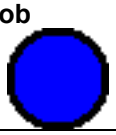


Figure 10: The Unload Screen

Each rotary adjustment knob on the Operator Interface performs a different function when unloading granular material. See the table below.

Input	Action	Function
Green On / Standby Knob 	Twist Left	Decrease the auger or direct output percentage.
	Twist Right	Increase the auger or direct output percentage.
	Pushbutton	Start unloading material. Stop unloading material.
Blue Blast Knob 	Twist Left	Decrease the spinner output percentage. (If available)
	Twist Right	Increase the spinner output percentage. (If available)
	Pushbutton	None



To reduce the risk of death or injury, ensure that all personnel are clear from moving machinery before activating outputs.

The “Status:” line displays whether or not the auger is running. The “RPM:” line displays the revolutions per minute of the auger according to its optional feedback sensor.

If Auger Reverse is enabled the auger unload direction can be adjusted using the Auger Reverse switch. See Switch Labels on page 3.

If both cross augers have the same parent function the Cross Auger Direction can be selected using the Cross switch. See Switch Labels on page 3.

To unload granular material:

STEP 1: Ensure that the system is in Standby.

STEP 2: Press the Menu button in the lower right corner of the screen to enter the main menu.

STEP 3: Press the Unload/Prime button on the screen to access the Unload/Prime menu.

STEP 4: Press the Unload button on the screen to access the unload screen.

STEP 5: Use the Green Knob to adjust the auger output percent.

STEP 6: Use the Blue Knob to adjust the spinner output percent.

STEP 7: Press the Green Knob to begin unloading granular material.

STEP 8: Press the Green Knob to finish unloading granular material.

STEP 9: Press the Ok button to return to the Main Menu when finished.

To unload direct material:

STEP 1: Ensure that the system is in Standby.

STEP 2: Press the Menu button in the lower right corner of the screen to enter the main menu.

STEP 3: Press the Unload/Prime button on the screen to access the Unload/Prime menu.

STEP 4: Press the Unload button on the screen to access the unload screen.

STEP 5: Use the Green Knob to adjust the direct output percent.

STEP 6: Press the Green Knob to begin unloading direct material.

STEP 7: Press the Green Knob to finish unloading direct material.

STEP 8: Press the Ok button to return to the Main Menu when finished.

Note: If 3 lane mode is enabled, the lane valve outputs are disabled in unload mode. The use of a manually operated 1/4 turn ball valve and unload port is required to unload the tank.

Prewet Prime

The Prewet Prime menu item allows you to prime the prewet pump. The Prewet Prime menu item is not accessible unless it has been enabled by a supervisor in calibration. When the Prewet Prime menu item is selected the screen shall look like Figure 11 below.

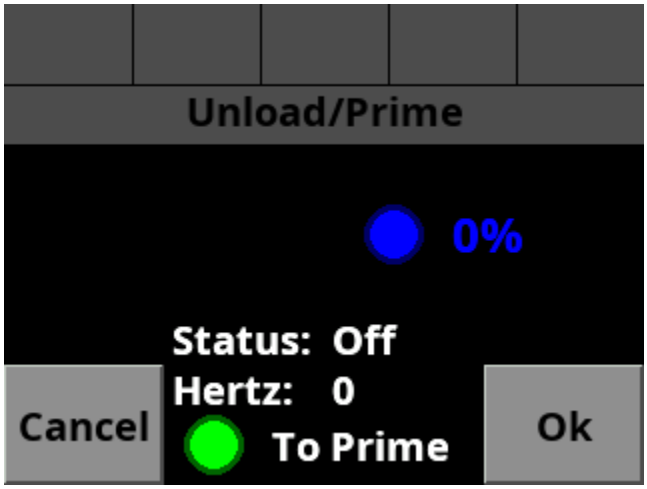
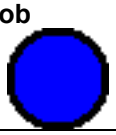


Figure 11: The Prewet Prime Screen

Each rotary adjustment knob on the Operator Interface performs a different function when priming the prewet pump. See the table below.

Input	Action	Function
Green On / Standby Knob 	Twist Left	Decrease the auger output percentage (if Prewet Drive Type is set to Exhaust).
	Twist Right	Increase the auger output percentage (if Prewet Drive Type is set to Exhaust).
	Pushbutton	Start priming the pump. Stop priming the pump.
Blue Blast Knob 	Twist Left	Decrease the prewet output percentage.
	Twist Right	Increase the prewet output percentage.
	Pushbutton	None



To reduce the risk of death or injury, ensure that all personnel are clear from moving machinery before activating outputs.

The “Status:” line displays whether or not the prewet pump is priming. The “Hertz:” line displays the prewet feedback according to its optional feedback sensor.

To prime the prewet pump:

STEP 1: Ensure that the system is in Standby.

STEP 2: Press the Menu button in the lower right corner of the screen to enter the main menu.

STEP 3: Press the Unload/Prime button on the screen to access the Unload/Prime menu.

STEP 4: Press the Prewet Prime button on the screen to access the Prewet Prime screen.

STEP 5: Use the Blue Knob to adjust the prewet output percent.

STEP 6: Press the Green Knob to begin priming the prewet pump.

STEP 7: Press the Green Knob to finish priming the prewet pump.

STEP 8: Press the Ok button to return to the Main Menu when finished.

Setting Sim Speed

Sim Speed is a spreader feature that causes the spreader to act as though the vehicle is moving while on the operation screen. Granular, spinner, and prewet outputs (if enabled) are run normally as if the vehicle is moving at the Set Sim Speed rate. Spreader data will be accumulated normally while Sim Speed is active.



To reduce the risk of death or injury, ensure that all personnel are clear from moving machinery before increasing Sim Speed above 0 mph/kph.

When Sim Speed is enabled in Calibration, you will have access to the Sim Speed menu in the main menu.

To activate Sim Speed:

STEP 1: Ensure that the system is in Standby.

STEP 2: Press the Menu button in the lower right corner of the screen to enter the main menu.

STEP 3: Press the Sim Speed button to enter the Sim Speed menu.

STEP 4: Press the On/Off button to access the Sim Speed On/Off option.

STEP 5: Press the right arrow to set Sim Speed On/Off to on.

STEP 6: Press the Ok button to save the setting and return to the Sim Speed Menu.

STEP 7: Press the Speed button to access the Sim Speed Speed option.

STEP 8: Use the arrow buttons to adjust the speed to the desired level.

STEP 9: Press the Ok button to save the setting and return to the Sim Speed Menu.

STEP 10: Press the Back button to return to the Main menu.

STEP 11: Press the Back button to return to the Operation screen.

STEP 12: Use the Green Knob to adjust the auger output percent.

While Sim Speed is active the header bar will display SIM SPEED # MPH or KPH in yellow where # is the speed set in the Sim Speed menu.

If the vehicle's actual ground speed increases beyond 5 mph or 5 kph, the header bar will display SIM SPEED OFF in red. Sim Speed will stop affecting any outputs and be automatically deactivated.

Using the optional Hoist and Plow Controls (5150 or FORCE America ONE™ Systems)



See your FORCE America representative for more information on the 5150 or FORCE America ONE™ option.

Switch Labels – 5150 and FORCE America ONE™ Systems



Figure 12: Switch Labels – 5150 Mode and FORCE America ONE™ Systems

On 5150 and FORCE America ONE™ systems the first 3 switches control the hoist and plow instead of auger direction, cross direction and clear jam. See the table below for how the switches work with the 5150 or FORCE America ONE systems.

Active switch functions are indicated with a green color. If a switch is currently not used the label is left blank. The switch label will appear red if the operator selected the Disable option on the stuck switch error condition at startup. When in this state the affected function will not be able to be activated.

Switch	Function	Availability Requires
	Momentarily activates the Hoist, running it at 100% until the switch or interlock is released. Pressing both the top switch and the interlock (integrated into the back of the controller) at the same time will move the hoist up. Pressing both the bottom switch and the interlock will move it down.	The system must be a 5150 or FORCE America ONE™ model and the Hoist & Plow option in calibration must be set to Hoist or Hoist & Plow.
	Momentarily activates the Plow, running it at 100% until the switch is released. The interlock switch is not required to run these functions. Pressing the top switch will move the plow up and the bottom switch will move it down.	The system must be a 5150 or FORCE America ONE™ model and the Hoist & Plow option in calibration must be set to Plow or Hoist & Plow.

	Momentarily activates the Plow, running it at 100% until the switch is released. The interlock switch is not required to run these functions. Pressing the top switch will move the plow left and the bottom switch will move it right.	The system must be a 5150 or FORCE America ONE™ model and the Hoist & Plow option in calibration must be set to Plow or Hoist & Plow.

Menu Items – 5150 and FORCE America ONE™ Systems

The following menu item becomes available in the Main menu on 5150 and FORCE America ONE™ models.

Plow Float
The Plow Float menu item allows you to turn on and off Plow Float. Use the left and right arrow buttons on the screen to select between the different options. As with all options pressing OK will save your selection and pressing Cancel will discard it. The Plow Float menu item is only available with 5150 or FORCE America ONE™ systems.

Using the optional Remote Controls

When the system is equipped with the optional remote controls, the operator can adjust the system using either the remote controls or the controls located on the SSC5100ex unit.

Switch Operation

Switches that are connected to the SSC5100ex will perform the identical action as the switches on the SSC5100ex unit.

Knob Operation

The knobs on the remote controls will perform the same function as the similarly colored knob on the SSC5100ex unit. The remote controls contain an additional knob which is grey in color, this knob will allow for the adjustment of the prewet application rate without having to enter the Material Menu.

Joystick Operation (5150 or FORCE America ONE™ Systems Only)

When the system is equipped with the optional 5150 or FORCE America ONE™ remote joystick box, the operator can activate the hydraulic functions through the use of the non-proportional joystick. The pushbutton on the joystick will function as the hoist selector when used in a system that contains both a plow and hoist or the hoist interlock when used with a system that just contains the hoist function. When pressed the pushbutton will latch on the hoist operation until the joystick returns to the center position where the state of the button will be evaluated to determine which function should be operated.

Troubleshooting and Error Conditions

There are two places error conditions can be displayed: in the Header Bar or in an Error Window.

Header Bar Warnings

As described on page 5, The Header Bar can display System Status messages and icons when an error occurs.

System Status Message	Condition	Recommended Action
AUGER FB ERR	The auger / conveyor feedback is not being detected either because the sensor is disconnected or the auger / conveyor is jammed.	Verify the auger / conveyor is not jammed and that the sensor is properly connected. Temporary operation can be performed by allowing the spreader to default to Open Loop mode.
AUG FWD OPEN CIRCUIT	An open condition has been detected with the auger forward valve and Open Circuit Detection has been Enabled.	Verify that the harnessing for the auger forward valve is properly connected. Verify that the harnessing for the auger forward valve is not damaged.
AUGER OPEN	An Auger Feedback Error has been active for 10 seconds and the system has defaulted to open loop mode.	The auger will continue to run in open loop until the system is reset.
AUGER RANGE	The auger / conveyor cannot dispense material fast enough to meet the desired rate.	Lower the application rate or vehicle speed until the system can meet the desired rate.
AUG REV OPEN CIRCUIT	An open condition has been detected with the auger reverse valve and Open Circuit Detection has been Enabled.	Verify that the harnessing for the auger reverse valve is properly connected. Verify that the harnessing for the auger reverse valve is not damaged.
AUX 1 DISABLED	Aux 1 was active on startup and disabled by the user.	The System will continue to run while ignoring Aux Input 1

System Status Message	Condition	Recommended Action
AUX 2 DISABLED	Aux 2 was active on startup and disabled by the user.	The System will continue to run while ignoring Aux Input 2
BODY UP	The dump body of the vehicle is currently hoisted in the up position.	Lower the dump body before moving the vehicle.
CONVEYOR STALL	The auger / conveyor is jammed and is not turning.	Clear the auger / conveyor jam.
CROSS 1 OPEN CIRCUIT	An open condition has been detected with the cross 1 valve and Open Circuit Detection has been Enabled.	Verify that the harnessing for the cross 1 valve is properly connected. Verify that the harnessing for the cross 1 valve is not damaged.
CROSS 2 OPEN CIRCUIT	An open condition has been detected with the cross 2 valve and Open Circuit Detection has been Enabled.	Verify that the harnessing for the cross 2 valve is properly connected. Verify that the harnessing for the cross 2 valve is not damaged.
DIRECT FB ERR	The direct feedback is not being detected because either the sensor is disconnected or the direct tank is empty or too low.	Verify the direct tank is not empty and that the direct sensor is properly connected.
DIRECT OPEN CIRCUIT	An open condition has been detected with the direct valve and Open Circuit Detection has been Enabled. NOTE: This error is disabled when the Direct Drive Type is set to Electric.	Verify that the harnessing for the direct valve is properly connected. Verify that the harnessing for the direct valve is not damaged.

System Status Message	Condition	Recommended Action
DIRECT RANGE	The direct pump cannot dispense material fast enough to meet the desired rate.	Lower the application rate or vehicle speed until the system can meet the desired rate.
DIR SHUTDOWN	A Direct Feedback Error has been active for 10 seconds and the direct output has been shut down.	Direct has been automatically shut off to prevent possible damage to the pump. It can be turned back on by taking the system out of standby.
FB GND SHORT	A short has been detected with the feedback sensor ground wire.	Verify that the harnessing for the feedback sensor is properly connected. Verify that the harnessing for the feedback sensor is not damaged.
FB PWR SHORT	A short has been detected with the feedback sensor power wire.	Verify that the harnessing for the feedback sensor is properly connected. Verify that the harnessing for the feedback sensor is not damaged.
FILTER BYPASS	The oil filter's bypass valve for the hydraulic system has been activated.	Return the vehicle for maintenance.
GATE OVERRIDE	A Gate Sensor Error or a Gate Position Error occurred and the user acknowledged the error.	Verify the gate is in the proper position for the current material. Verify the gate sensor is working properly.
GATE POSITION	The system detected that the gate was in the wrong position.	Verify that the gate is in the proper position.
GATE SENSOR	The system detected both the low and high gate sensors as active.	Verify that the gate sensor is wired properly.

System Status Message	Condition	Recommended Action
HOIST DIR OPEN CIRCUIT	An open condition has been detected with the hoist direction valve and Open Circuit Detection has been Enabled.	Verify that the harnessing for the hoist direction valve is properly connected. Verify that the harnessing for the hoist direction valve is not damaged.
HOIST DOWN OPEN CIRCUIT	An open condition has been detected with the hoist down valve and Open Circuit Detection has been Enabled.	Verify that the harnessing for the hoist down valve is properly connected. Verify that the harnessing for the hoist down valve is not damaged.
HOIST INTERLOCK	The hoist up or down switch is pressed and the hoist interlock is not pressed.	Press the hoist interlock switch on the back of the controller to allow the hoist to run.
HOIST OPEN CIRCUIT	An open condition has been detected with the hoist valve and Open Circuit Detection has been Enabled.	Verify that the harnessing for the hoist valve is properly connected. Verify that the harnessing for the hoist valve is not damaged.
HOIST UP OPEN CIRCUIT	An open condition has been detected with the hoist up valve and Open Circuit Detection has been Enabled.	Verify that the harnessing for the hoist up valve is properly connected. Verify that the harnessing for the hoist up valve is not damaged.
J1939 SPEED	The System can't detect any speed messages on the J1939 CAN bus.	Verify the 5100ex is connected properly connected to the vehicles J1939 CAN bus. Verify the J1939 Baud Rate is set to the proper value.

System Status Message	Condition	Recommended Action
LOW DIRECT	The direct low material input has been active for 5 or more seconds.	The system is running low on direct material and should be refilled soon. If set to Warn + Disable in calibration, Direct will automatically be turned off.
LOW MATERIAL	The granular low material input has been active for 5 or more seconds.	The system is running low on granular material and should be refilled soon.
LOW PREWET	The prewet low liquid input has been active for 5 or more seconds.	The system is running low on prewet liquid and should be refilled soon. If set to Warn + Disable in calibration, Prewet will automatically be turned off.
NO REMOTE OI	The 5100ex has lost communication with the remote controls and the failure has been acknowledged by the operator.	Verify that the harness connecting the remote controls to the 5100ex is properly connected. Verify that the harness for the remote controls is not damaged.
NO REMOTE 5150 JS	The 5100ex has lost communication with the remote 5150 JS and the failure has been acknowledged by the operator.	Verify that the harness connecting the remote 5150 JS to the 5100ex is properly connected. Verify that the harness for the remote 5150 JS is not damaged.
OIL LEVEL	The hydraulic oil level input is active from the oil level being below safe limits.	Return the vehicle for maintenance.
OIL TEMP	The hydraulic oil temp input is active from the oil temperature being above safe limits.	Return the vehicle for maintenance.

System Status Message	Condition	Recommended Action
PLOW DOWN OPEN CIRCUIT	An open condition has been detected with the plow down valve and Open Circuit Detection has been Enabled.	Verify that the harnessing for the plow down valve is properly connected. Verify that the harnessing for the plow down valve is not damaged.
PLOW FLOAT	The plow down float has been activated.	The system will continue to run plow down until the plow up switch is pressed.
PLOW FLOAT DISABLED	The plow down float has been disabled.	The System will not run the plow float.
PLOW LEFT OPEN CIRCUIT	An open condition has been detected with the plow left valve and Open Circuit Detection has been Enabled.	Verify that the harnessing for the plow left valve is properly connected. Verify that the harnessing for the plow left valve is not damaged.
PLOW RIGHT OPEN CIRCUIT	An open condition has been detected with the plow right valve and Open Circuit Detection has been Enabled.	Verify that the harnessing for the plow right valve is properly connected. Verify that the harnessing for the plow right valve is not damaged.
PLOW UP OPEN CIRCUIT	An open condition has been detected with the plow up valve and Open Circuit Detection has been Enabled.	Verify that the harnessing for the plow up valve is properly connected. Verify that the harnessing for the plow up valve is not damaged.
PREWET FB ERR	The prewet feedback is not being detected because either the sensor is disconnected or the prewet tank is empty or too low.	Verify the prewet tank is not empty and that the prewet sensor is properly connected. The system can continue to spread granular material, but prewet will be automatically shut off if the error continues.

System Status Message	Condition	Recommended Action
PREWET OPEN CIRCUIT	An open condition has been detected with the prewet valve and Open Circuit Detection has been Enabled. NOTE: This error is disabled when the Prewet Drive Type is set to Electric.	Verify that the harnessing for the prewet valve is properly connected. Verify that the harnessing for the prewet valve is not damaged.
PREWET RANGE	The prewet pump cannot dispense liquid fast enough to meet the desired rate.	Lower the application rate or vehicle speed until the system can meet the desired rate.
PREWET SHUTOFF	A Prewet Feedback Error has been active for 10 seconds and the prewet output has been shut down.	Prewet has been automatically shut off to prevent possible damage to the pump. It can be turned back on by pressing the prewet switch.
SIM SPEED # MPH or SIM SPEED # KPH	Sim Speed is active and set to # MPH or KPH.	The system will operate as though it is moving at the indicated speed.
SIM SPEED OFF	The truck moved while Sim Speed was active.	Sim Speed has been turned off. It can be turned back on normally.
SLOW DOWN	The truck is moving too fast.	Slow down.
SPINNER 1 OPEN CIRCUIT	An open condition has been detected with the spinner 1 valve and Open Circuit Detection has been Enabled.	Verify that the harnessing for the spinner 1 valve is properly connected. Verify that the harnessing for the spinner 1 valve is not damaged.

System Status Message	Condition	Recommended Action
SPINNER 2 OPEN CIRCUIT	An open condition has been detected with the spinner 2 valve and Open Circuit Detection has been Enabled.	Verify that the harnessing for the spinner 2 valve is properly connected. Verify that the harnessing for the spinner 2 valve is not damaged.
# GAL REM or # L REM	Material Countdown is enabled and the liquid remaining is above the low liquid %.	The system will count down the liquid remaining as it outputs liquid.
# GAL REM or # L REM	Material Countdown is enabled and the liquid remaining is below the low liquid %.	The system will count down the liquid remaining as it outputs liquid. Refill the tank, then update the liquid remaining in the Material menu.

PreCise Status Icon	Condition	Recommended Action
	The spreader is connected to the PreCise MRM device and transferring data normally.	None. The PreCise system is working normally.
	The spreader is unable to communicate with the PreCise MRM device.	Verify that the connectors on the 9-pin RS-232 harness are tightly secured. Verify that the 9-pin RS-232 harness is not damaged. Verify that the PreCise MRM device is powered. Verify that the PreCise MRM device is running the latest firmware. Contact a FORCE America Representative for assistance.

Error Windows

The SSC5100ex can display error windows at startup to inform you of error conditions in your spreader system. The table below describes the error windows that can occur, possible causes, and their solutions.

Error Text	Possible Causes	Possible Solutions
5150 Not Installed	The unit is not a 5150 or FORCE America ONE™ model and has detected the presence of a Remote Joystick Box.	Disconnect the Remote Joystick Box Please contact your FORCE America representative for help.
Addr Load Exception	The unit experienced a software reset caused by an exception.	Please contact your FORCE America representative for help.
Addr Store Exception	The unit experienced a software reset caused by an exception.	Please contact your FORCE America representative for help.
Arithmetic Overflow	The unit experienced a software reset caused by an exception.	Please contact your FORCE America representative for help.
Auger Forward Short Error	A short condition has been detected with the auger forward valve.	Verify that the harnessing for the auger forward valve is properly connected. Verify that the harnessing for the auger forward valve is not damaged.
Auger Reverse Short Error	A short condition has been detected with the auger reverse valve.	Verify that the harnessing for the auger reverse valve is properly connected. Verify that the harnessing for the auger reverse valve is not damaged.
Aux 1 Short Error	A short condition has been detected with the aux 1 valve.	Verify that the harnessing for the aux 1 valve is properly connected. Verify that the harnessing for the aux 1 valve is not damaged.

Error Text	Possible Causes	Possible Solutions
Aux 2 Short Error	A short condition has been detected with the aux 2 valve.	Verify that the harnessing for the aux 2 valve is properly connected. Verify that the harnessing for the aux 2 valve is not damaged.
Aux Flash Failure	The system cannot communicate with the internal auxiliary flash memory.	Please contact your FORCE America representative for help.
Breakpoint Exception	The unit experienced a software reset caused by an exception.	Please contact your FORCE America representative for help.
Calibration Settings Failure	The system failed to load calibration settings. Safe defaults have been loaded.	Please contact your FORCE America representative for help.
Center Lane Short Error	A short condition has been detected with the center lane valve.	Verify that the harnessing for the center lane valve is properly connected. Verify that the harnessing for the center lane valve is not damaged.
Check Fuse	The system is not detecting power on the fused circuit.	Verify that the fuse is not blown, if it is blown replace with a 15 Amp fuse.
Coprocessor Exception	The unit experienced a software reset caused by an exception.	Please contact your FORCE America representative for help.
Cross 1 Short Error	A short condition has been detected with the cross 1 valve.	Verify that the harnessing for the cross 1 valve is properly connected. Verify that the harnessing for the cross 1 valve is not damaged.
Cross 2 Short Error	A short condition has been detected with the cross 2 valve.	Verify that the harnessing for the cross 2 valve is properly connected. Verify that the harnessing for the cross 2 valve is not damaged.

Error Text	Possible Causes	Possible Solutions
Data Bus Exception	The unit experienced a software reset caused by an exception.	Please contact your FORCE America representative for help. Please have the unit serial number available when contacting them.
Data Totals Corrupt	The system detected an issue with the stored data totals. The data totals will be reset.	Verify that the system power and dashkey inputs are wired properly.
Direct Short Error	A short condition has been detected with the direct valve.	Verify that the harnessing for the direct valve is properly connected. Verify that the harnessing for the direct valve is not damaged.
Error Log Corrupt	The system detected an issue with the stored error log. The error log will be reset.	Verify that the system power and dashkey inputs are wired properly.
Gate Sensor Error	The system detected both the low and high gate sensors as active.	Verify that the gate sensor is working properly.
Hardware Settings Error	The system detected an issue with one of the stored hardware settings. The data will not be loaded.	Please contact your FORCE America representative for help.
Hoist Direction Short Error	A short condition has been detected with the hoist direction valve.	Verify that the harnessing for the hoist direction valve is properly connected. Verify that the harnessing for the hoist direction valve is not damaged.
Hoist Down Short Error	A short condition has been detected with the hoist down valve.	Verify that the harnessing for the hoist down valve is properly connected. Verify that the harnessing for the hoist down valve is not damaged.
Hoist Short Error	A short condition has been detected with the hoist valve.	Verify that the harnessing for the hoist valve is properly connected. Verify that the harnessing for the hoist valve is not damaged.

Error Text	Possible Causes	Possible Solutions
Hoist Up Short Error	A short condition has been detected with the hoist up valve.	Verify that the harnessing for the hoist up valve is properly connected. Verify that the harnessing for the hoist up valve is not damaged.
Improper Dashkey Wiring	The system detected an improper shut down caused by dash key being wired to system power.	Verify that the system power and dashkey inputs are wired properly.
Incomplete Data Write	The system lost power when saving the data totals and operation settings during shutdown.	Verify that the system power and dashkey inputs are wired properly. Allow enough time (approx. 5 seconds) after shutting the system off before removing constant power when connected through a battery disconnect.
Instr Bus Exception	The unit experienced a software reset caused by an exception.	Please contact your FORCE America representative for help.
Left Lane Short Error	A short condition has been detected with the left lane valve.	Verify that the harnessing for the left lane valve is properly connected. Verify that the harnessing for the left lane valve is not damaged.
Operation Settings Failure	The system failed to load operation settings. Safe defaults have been loaded.	Please contact your FORCE America representative for help.
Please fix the gate issue before spreading.	The gate is in the wrong position. The gate sensors are malfunctioning.	Verify the gate is in the right position. Verify that the gate sensor is working properly. Press the override button to ignore the gate issue.
Plow Down Short Error	A short condition has been detected with the plow down valve.	Verify that the harnessing for the plow down valve is properly connected. Verify that the harnessing for the plow down valve is not damaged.

Error Text	Possible Causes	Possible Solutions
Plow Float Short Error	A short condition has been detected with the plow float valve.	Verify that the harnessing for the plow float valve is properly connected. Verify that the harnessing for the plow float valve is not damaged.
Plow Left Short Error	A short condition has been detected with the plow left valve.	Verify that the harnessing for the plow left valve is properly connected. Verify that the harnessing for the plow left valve is not damaged.
Plow Right Short Error	A short condition has been detected with the plow right valve.	Verify that the harnessing for the plow right valve is properly connected. Verify that the harnessing for the plow right valve is not damaged.
Plow Up Short Error	A short condition has been detected with the plow up valve.	Verify that the harnessing for the plow up valve is properly connected. Verify that the harnessing for the plow up valve is not damaged.
Prewet Short Error	A short condition has been detected with the prewet valve.	Verify that the harnessing for the prewet valve is properly connected. Verify that the harnessing for the prewet valve is not damaged.
Remote 5150 JS Comm Err	The system has lost communication with the remote 5150 Joystick controls.	Verify that the harness connecting the remote 5150 joystick controls to the 5100ex is properly connected. Verify that the harness for the remote 5150 joystick controls is not damaged.
Remote OI Comm Err	The system has lost communication with the remote operator interface controls.	Verify that the harness connecting the remote operator interface controls to the 5100ex is properly connected. Verify that the harness for the remote operator interface controls is not damaged.
Reserved Instruction	The unit experienced a software reset caused by an exception.	Please contact your FORCE America representative for help.

Error Text	Possible Causes	Possible Solutions
Right Lane Short Error	A short condition has been detected with the right lane valve.	Verify that the harnessing for the right lane valve is properly connected. Verify that the harnessing for the right lane valve is not damaged.
Spinner 1 Short Error	A short condition has been detected with the spinner 1 valve.	Verify that the harnessing for the spinner 1 valve is properly connected. Verify that the harnessing for the spinner 1 valve is not damaged.
Spinner 2 Short Error	A short condition has been detected with the spinner 2 valve.	Verify that the harnessing for the spinner 2 valve is properly connected. Verify that the harnessing for the spinner 2 valve is not damaged.
Stuck Blast Knob	The blue blast knob was pressed during startup.	Verify that the blue blast knob is not pressed. If selecting “Retry” does not fix the error, select “Disable” to turn off the knob.
Stuck Input #	The indicated input was on during startup.	Verify that the input is not active. If selecting “Retry” does not fix the error, select “Disable” to turn off this input.
Stuck Interlock	The interlock was pressed during startup.	Verify that the interlock is not pressed. If selecting “Retry” does not fix the error, select “Disable” to turn off this switch.
Stuck Remote Blast	The remote blast input on the remote control was active during startup.	Verify that the remote blast input connection to the remote control is not active. If selecting “Retry” does not fix the error, select “Disable” to turn off the input.
Stuck Remote Blast Knob	The blue blast knob on the remote control was pressed during startup.	Verify that the blue blast knob on the remote control is not pressed. If selecting “Retry” does not fix the error, select “Disable” to turn off the knob. Selecting disable will also turn off the corresponding knob on the SSC5100ex unit.
Stuck Remote JS Button	The joystick button on the 5150 remote joystick was pressed during startup.	Verify that the joystick button on the 5150 JS is not pressed. If selecting “Retry” does not fix the error, select “Disable” to turn off the input.

Error Text	Possible Causes	Possible Solutions
Stuck Remote JS Down	The joystick on the 5150 remote joystick was moved in the down direction during startup.	Verify that the joystick on the 5150 JS is centered. If selecting “Retry” does not fix the error, select “Disable” to turn off the input.
Stuck Remote JS Left	The joystick on the 5150 remote joystick was moved in the left direction during startup.	Verify that the joystick on the 5150 JS is centered. If selecting “Retry” does not fix the error, select “Disable” to turn off the input.
Stuck Remote JS Right	The joystick on the 5150 remote joystick was moved in the right direction during startup.	Verify that the joystick on the 5150 JS is centered. If selecting “Retry” does not fix the error, select “Disable” to turn off the input.
Stuck Remote JS Up	The joystick on the 5150 remote joystick was moved in the Up direction during startup.	Verify that the joystick on the 5150 JS is centered. If selecting “Retry” does not fix the error, select “Disable” to turn off the input.
Stuck Remote Standby	The remote standby input on the remote control was active during startup.	Verify that the remote standby input connection to the remote control is not active. If selecting “Retry” does not fix the error, select “Disable” to turn off the input.
Stuck Remote Stnby Knob	The green on/standby knob on the remote control was pressed during startup.	Verify that the green on/standby knob on the remote control is not pressed. If selecting “Retry” does not fix the error, select “Disable” to turn off the knob. Selecting disable will also turn off the corresponding knob on the SSC5100ex unit.

<table>
<tr><th>Error Text</th><th>Possible Causes</th><th>Possible Solutions</th></tr>
<tr><td>Stuck Remote Switch #A</td><td>The top half of the indicated switch or joystick direction on the remote control was active during startup.</td><td>Verify that the top half of the indicated switch or joystick on the remote control is not active. If selecting “Retry” does not fix the error, select “Disable” to turn off this switch.

When used with the 5150ex Remote Joystick Box (PN 1103485) the remote switches will relate to the following joystick movements.

<table><tr><th>Switch Description</th><th>Joystick Movement</th></tr><tr><td>1A</td><td>Pushbutton (Interlock)</td></tr><tr><td>2A</td><td>Backward</td></tr><tr><td>3A</td><td>Left</td></tr></table></td></tr>
<tr><td>Stuck Remote Switch #B</td><td>The bottom half of the indicated switch or joystick direction on the remote control was active during startup.</td><td>Verify that the bottom half of the indicated switch on the remote control or joystick is not active. If selecting “Retry” does not fix the error, select “Disable” to turn off this switch.

When used with the 5150ex Remote Joystick Box (PN 1103485) the remote switches will relate to the following joystick movements.

<table><tr><th>Switch Description</th><th>Joystick Movement</th></tr><tr><td>2B</td><td>Forward</td></tr><tr><td>3B</td><td>Right</td></tr></table></td></tr>
<tr><td>Stuck Standby Knob</td><td>The green on / standby knob was pressed during startup.</td><td>Verify that the green on / standby knob is not pressed. If selecting “Retry” does not fix the error, select “Disable” to turn off the knob.</td></tr>
<tr><td>Stuck Switch #A</td><td>The top half of the indicated switch was pressed during startup.</td><td>Verify that the top half of the indicated switch is not pressed. If selecting “Retry” does not fix the error, select “Disable” to turn off this switch.</td></tr>
<tr><td>Stuck Switch #B</td><td>The bottom half of the indicated switch was pressed during startup.</td><td>Verify that the bottom half of the indicated switch is not pressed. If selecting “Retry” does not fix the error, select “Disable” to turn off this switch.</td></tr>
</table>

Error Text	Possible Causes	Possible Solutions
Stuck Touchscreen	The touchscreen was pressed during startup.	Verify the touchscreen is not pressed.
Syscall Exception	The unit experienced a software reset caused by an exception.	Please contact your FORCE America representative for help.
TLB Refill Exception	The unit experienced a software reset caused by an exception.	Please contact your FORCE America representative for help.
Trap Exception	The unit experienced a software reset caused by an exception.	Please contact your FORCE America representative for help.
Unexpected Interrupt	The unit experienced a software reset caused by an exception.	Please contact your FORCE America representative for help.
Unstable Battery Voltage	The voltage supplied to the unit is below the operational limit or the voltage fluctuation is larger than allowed by the unit.	Verify that the power and ground connections are secure. Verify that power wire is connected to a stable constant power source.
USB Communication Error	The unit encountered an issue when attempting to write/read information from the USB drive.	Verify that the USB drive is securely connected. Verify that the USB drive is operational.
WDT Reset	The unit experienced a hardware reset caused by the expiration of the watch dog timer.	Please contact your FORCE America representative for help.

Error Log Messages

The error log displays the same message that is displayed to the operator during operation. In addition to those messages the error log can contain the messages described in the table below.

Error Text	Possible Causes	Possible Solutions
Calibration Settings Updated	The calibration settings were updated.	If this was done by another user, the access code can be changed to prevent the other user from adjusting settings in the future.
Error Log Cleared	The error log was cleared intentionally using the menu system or the error log was detected as corrupt and cleared.	Verify that the system power and dashkey inputs are wired properly if the clearing was unintentional.
PreCise Communication Error	The cable between the 5100ex and the PreCise unit has become disconnected. The cable between the 5100ex and PreCise unit is damaged or broken. The PreCise unit is not powered up.	Verify that the cable is securely connected at the 5100ex and at the PreCise Unit. Inspect the cable for damage and replace if broken. Verify that the PreCise unit is properly connected to power.
Upgrade Installed	A firmware upgrade was installed	If this was done by another user, the access code can be changed to prevent the other user from upgrading the system in the future.

Diagnostic Mode

In diagnostic mode the system will run the same as it does on the operation screen, but will display more information about the outputs to the user.

To enter Diagnostic Mode:

STEP 1: Ensure that the system is in Standby.

STEP 2: Press the Menu button in the lower right corner of the screen to enter the main menu.

STEP 3: Press the Next button to see more options.

STEP 4: Press the Data button to enter the Data menu.

STEP 5: Press the Diagnostic button to enter Diagnostic Mode

The Diagnostic Screen

The figure below highlights what each field displays while in granular diagnostic mode. The auxiliary output states will turn green when active or white when inactive. In 5150 Mode there is no Cross 1, Cross 2, Spinner 2, Aux 1, or Aux 2. They will not be displayed on screen in 5150 Mode.

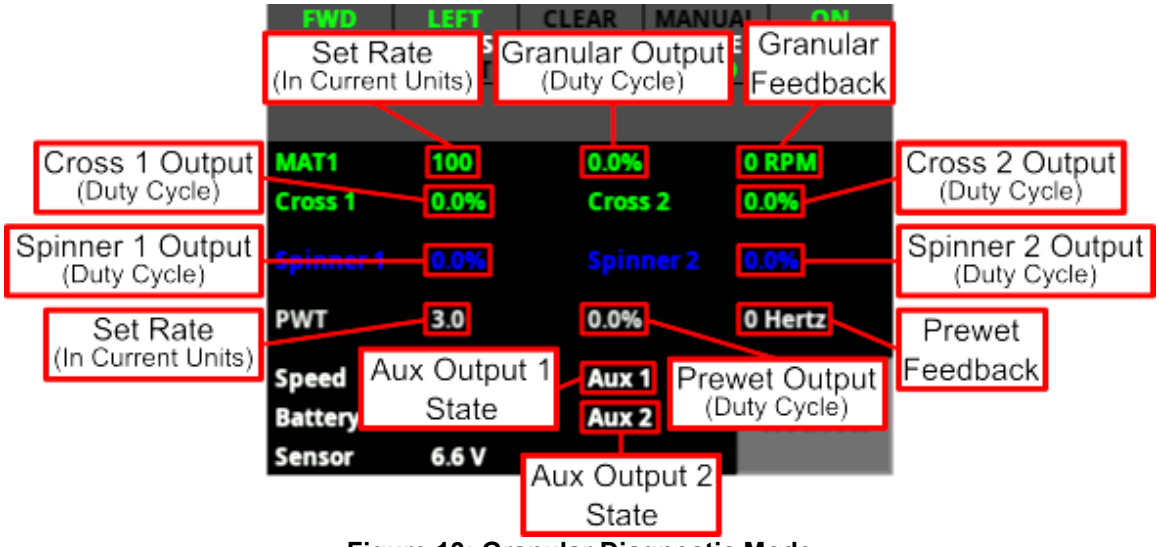


Figure 13: Granular Diagnostic Mode

The figure below highlights what each field displays while in direct diagnostic mode. When the system is in multilane mode the auxiliary outputs are replaced with the lane outputs. The auxiliary/lane output states will turn green when active or white when inactive.

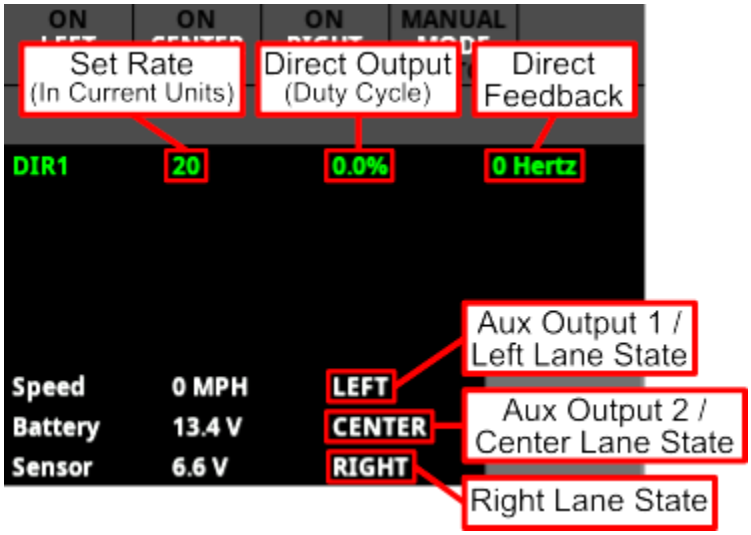


Figure 14: Direct Diagnostic Mode

FORCE America Contact Information

Should you encounter problems with your SSC5100ex system that are not documented in this Operation Manual or the SSC5100ex Calibration Manual, please contact your local FORCE America Sales Representative for assistance.

For company and product information, please contact FORCE America at:

Phone: 1-888-99FORCE (1-888-993-6723)
Website: http://www.forceamerica.com
E-mail: info@forceamerica.com



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