

## SSC5100ex Features Comparison

Feature	Firmware Version							
	3.3 / 3.5	3.6	3.9	4.0	4.2 / 4.3	4.4	4.5	4.6
<ul style="list-style-type: none"> <li>Resolved an issue that resulted in the system continuously restarting when a switch/input was stuck on startup.</li> </ul>								X
<ul style="list-style-type: none"> <li>Change the default valve frequency value to 200 Hz.</li> <li>Increased the prewet displacement upper range value.</li> </ul>							X	X
<ul style="list-style-type: none"> <li>Resolved an issue with granular and direct manual only mode not working.</li> <li>Increased the max prewet application rate.</li> </ul>						X	X	X
<ul style="list-style-type: none"> <li>Added prewet material countdown</li> <li>Added direct material countdown</li> <li>Added blast alarm</li> </ul>					X	X	X	X
<ul style="list-style-type: none"> <li>Added new header bar error messages for remote control and feedback sensor power shorts.</li> </ul>				X	X	X	X	X
<ul style="list-style-type: none"> <li>Added support for using the direct liquid application for dust control or herbicide application.</li> <li>Added a new option for spinner parent of AUGER.</li> </ul>			X	X	X	X	X	X
<ul style="list-style-type: none"> <li>Changed the manual mode switch text.</li> </ul>		X	X	X	X	X	X	X
<ul style="list-style-type: none"> <li>Added the two position gate feature.</li> </ul>	X	X	X	X	X	X	X	X

## 5100ex Change Log for Stable Releases

### 5100ex Spreader Control Software (4.6), Released 2021-12-23

#### Issues Resolved:

- Fixed an issue where that resulted in the system continuously restarting when a switch/input was detected as stuck on startup.

### 5100ex Spreader Control Software (4.5), Released 2021-06-22

#### Other Changes:

- Changed the default frequency to be 200 Hz to support the coils that are part of the Gen2 VDM.
- Increased the range on the prewet liquid displacement calibration value.

### 5100ex Spreader Control Software (4.4), Released 2021-04-08

#### Issues Resolved:

- Fixed the issue where granular and direct manual mode only operation loop mode was not able to be activated on the controller.

#### Other Changes:

- Increased the prewet max set rate to 99.9 gal/ton (425 L/ton).
- Changed the prewet displacement range to match the anti-ice displacement range.
- Changed the operation of the direct max duty cycle screen so that the max Hz was not automatically updated if the system did not measure any feedback while running the output.

### 5100ex Spreader Control Software (4.3), Released 2021-03-01

#### Other Changes:

- Changed the alarm level defaults.

### 5100ex Spreader Control Software (4.2), Released 2021-02-12

#### New Features:

- Added the prewet liquid material countdown for indicating the amount of prewet liquid remaining.
- Added the direct liquid material countdown for indicating the amount of direct liquid remaining.
- Added a selectable alarm level to sound while blast application is active.

### 5100ex Spreader Control Software (4.0), Released 2019-10-04

#### New Features:

- Added a new header bar error messages for when the power output to the remote control and feedback sensors is shorted to assist in identification and troubleshooting of this condition.

#### Issues Resolved:

- Corrected an issue that was preventing the spinner from operating in manual mode with blast when the vehicle was not moving and the ground speed interrupt was enabled.

#### Other Changes:

- Lowered the minimum K-Value (displacement pulses/volume) to accommodate larger flowmeters for prewet, anti-ice, dust control and herbicide operation.
- Changed the default K-Value (displacement pulses/volume) for prewet application to 750.

- Changed the default K-Value (displacement pulses/volume) for anti-ice, dust control and herbicide to 50.

### **5100ex Spreader Control Software (3.9), Released 2018-06-04**

#### New Features:

- Added the ability for the direct liquid application to be used for dust control application (gal/sq yd or liters/sq m) and herbicide application (gal/acre or liters/hectare). When used in these application modes there is the ability to set the application width determined by the active booms.
- Added the ability to allow the spinner to operate when the auger is operating in the forward and reverse directions with the new spinner parent option of AUGER.

#### Issues Resolved:

- Corrected an issue that was preventing the prewet rate to be adjusted in manual mode when using the remote operator interface.

#### Other Changes:

- Changed the default gain value for direct liquid application to be 100, which matches the value used in the majority of systems.
- Changed the default value for the “Oil Level” alarm and the “Oil Temp” alarm to be continuous beep.

### **5100ex Spreader Control Software (3.6), Released 2016-11-17**

#### Issues Resolved:

- Corrected an issue that was preventing the operator from changing the number of preset application rates for direct application.

#### Other Changes:

- Updated the manual mode switch text to indicate a setting of MODE and have the options of MANUAL and AUTO instead of the setting of MANUAL with the options of ON and OFF.
- Lowered the initial values when entering the total weight or volume when calibrating the material displacement settings.

### **5100ex Spreader Control Software (3.5), Released 2016-11-02**

#### Other Changes:

- Added additional factory diagnostics.

### **5100ex Spreader Control Software (3.3), Released 2016-10-24**

#### New Features:

- Added the two position gate feature for granular operation. This feature will sound an alarm and display a message when the gate is not detected in the specified position for the material being applied.

### **5100ex Spreader Control Software (3.2), Released 2016-08-08**

#### Other Changes:

- Modified the functionality of the screen power switch so that it defaults to on when the firmware version is upgraded and changed from a version that did not contain the feature.

### **5100ex Spreader Control Software (3.1), Released 2016-07-27**

#### New Features:

- Added the ability to set the calibration access code and data clear codes to the default entry code that is used when accessing these menus allowing the operator to enter these menus without having to change the code on the entry screen.
- Added a screen power switch, when enabled the spreader functions will not be able to be engaged until the operator has opted to continue and activate the Spreader Control. This option can be disabled if desired in calibration.

### **5100ex Spreader Control Software (3.0), Released 2016-02-17**

#### Other Changes:

- Improved the constant voltage input stability check during power up and shutdown of the system. If the voltage is not stable during these situations a message will be placed on the screen indicating the issue.

### **5100ex Spreader Control Software (2.9), Released 2015-12-02**

#### New Features:

- The hoist operation is latched active when the button is pressed until the joystick returns to the center position without the button pressed on the 5150 Remote Joystick systems.

#### Issues Resolved:

- Eliminated the WDT Error experienced when importing calibration settings using the USB key.

#### Other Changes:

- Modified the event string to contain its own totals separate from the data total values and removed trailing spaces that were being transmitted in some of the fields.
- Added a new error message to indicate if the system lost power while writing data to the storage location on shutdown.

### **5100ex Spreader Control Software (2.8), Released 2015-11-04**

#### Other Changes:

- Lowered the minimum K-Factor for the direct liquid flow meter to 40 (10 for metric).

### **5100ex Spreader Control Software (2.7), Released 2015-10-21**

#### New Features:

- Added a message to the error log to indicate when an upgrade was performed.
- Added a message to the error log to indicate when the calibration settings have been updated.

#### Issues Resolved:

- Corrected the operation of the cross auger and the spinner outputs to only operate when expected with the operation of auger reverse.
- Corrected an issue where the plow float enable calibration setting was being set to disabled on every boot.

#### Other Changes:

- Lowered the minimum K-Factor for the prewet to 40 (10 for metric).

### **5100ex Spreader Control Software (2.6), Released 2015-05-15**

#### Other Changes:

- Changed the default value for the plow float, to “Delayed” instead of “Disabled”, when used with the FORCE America ONE™ system

### **5100ex Spreader Control Software (2.5), Released 2015-04-23**

#### New Features:

- Added the high and low limit schemes for the FORCE America ONE™ system.

#### Other Changes:

- Added separate default values for the FORCE America ONE system.
- Granular loop mode can now be set to Manual.

### **5100ex Spreader Control Software (2.4), Released 2014-03-11**

#### New Features:

- Added the ability to run the cross auger during auger calibration. When calibrating the auger min/max the cross auger will run at max duty cycle. When performing the material drop test the cross auger will mimic the auger operation between min/max.
- Added support to operate auger exhaust prewet with a new drive type. When calibrating prewet min/max and the prewet drop test the auger will run at the specified percentage between auger min/max.
- Added support for integrating with the FORCE America ONE™ system. Joystick functions now contain a max duty cycle along with a limit percentage for each joystick function and granular auger.
- Added a “HOIST INTERLOCK” warning message when the hoist up or down is activated without the interlock being activated.

#### Issues Resolved:

- Stopped the “INSTR BUS EXCEPTION” and the “ADDR LOAD EXCEPTION” errors from occurring when the system was using remote controls.
- Corrected an issue with the auger and cross auger operating in the incorrect direction from indicated with the switches when in material unload.
- Corrected the CRC that is produced with an AVL event string to be the specified two digits.

#### Other Changes:

- Require the operator to always enter an access code by changing the initial access code to all spaces.

### **5100ex Spreader Control Software (2.2), Released 2014-11-26**

#### Issues Resolved:

- Changed the operation of blast in manual mode so that it will run the output when the ground speed interrupt option is enabled and no ground speed is present.

### **5100ex Spreader Control Software (2.1), Released 2014-09-12**

#### New Features:

- Added the ability to use the 5150ex remote joystick box to run the hoist and plow outputs when connected to a 5150ex.
- New calibration item used for selecting which 5150ex outputs (hoist and plow) are available. The 5150ex switches.

### **5100ex Spreader Control Software (2.0), Released 2014-05-29**

#### New Features:

- Added direct liquid application mode.
- Added remote operator interface support.
- Added new error to check valve/fuse power.

### **5100ex Spreader Control Software (1.9), Released 2013-12-20**

#### Issues Resolved:

- Fixed an issue that was causing some systems using the PreCise MRM system to generate an INSTR BUS ERR.
- Fixed an issue where the actual granular rate did not go to 0 when the vehicle came to a stop and the output shutoff.
- Fixed an issue where the range or feedback errors did not clear when the system was placed into manual mode.
- Fixed an issue where the range or feedback errors did not clear when the vehicle came to a stop.

#### Other Changes:

- Added support for ground speed inputs of 4000 pulses/MI. Improved the shutoff time to be dynamic based on the input setting to allow for better performance at the settings close to 20000 pulses/MI.
- Added support for use of the 512 PPR sensor on the fast shaft of a 50:1 gearbox but yet indicate the RPM and displacement of the slow shaft system.
- Remove the processing and display of the valve open/short detection in the diagnostic menu.

### **5100ex Spreader Control Software (1.8), Released 2013-11-18**

#### Issues Resolved:

- Fixed an issue where event logging strings were not printing out the correct granular or prewet set rate and total information.

### **5100ex Spreader Control Software (1.7), Released 2013-10-30**

#### Issues Resolved:

- Fixed an issue where the sim speed option no longer allowed the outputs to operate in a closed or open loop mode.
- Fixed an issue where the sim speed distance was not being logged for the material total dispensed distance. This now matches the 5100 and 6100 control system operation.

### **5100ex Spreader Control Software (1.6), Released 2013-10-28**

#### Issues Resolved:

- Fixed an issue with the vehicle movement detection with low pulses/distance settings. The system will now detect the vehicle moving sooner and should not require a pulse multiplier on the speedometer input lines.
- Fixed an issue where the system would not allow the blast feature to run when the vehicle was not moving. Blast can now be activated and will run the output at the jump start speed if the vehicle is not moving. (This matches the operation of the 5100 and 6100 controllers.)

### **5100ex Spreader Control Software (1.5), Released 2013-08-30**

#### Issues Resolved:

- Fixed an issue with the backlight pin which was allowing it to be on before the system was ready. This produced an unwanted white flash of the display screen.
- Fixed an issue that allowed values of 0 to be retrieved from the flash for the various stored settings to be valid. A value of 0 is not valid and the system now responds indicating this.

### **5100ex Spreader Control Software (1.4), Released 2013-08-01**

#### New Features:

- Retry/disable option when an input/switch is detected as being stuck on startup. Disabled options will turn the affected switch function red on the screen.
- Added the prewet prime functionality. Works similar to granular unload mode but is for prewet.
- Added the wrapping of the available options when setting up items in calibration instead of running into a stopping point and having to switch directions.
- Added valve error detection. Currently valve errors (opens/shorts) will only be reported in the diagnostic screen. When an error occurs the buzzer will sound at the alarm level setting in calibration.
- Added the prewet drive type selection of hydraulic or electric. This is used with the error detection since electric prewet will not allow for proper error detection on that output.
- Added the ground speed interrupt feature. This is used when the system is in manual mode and allows the spreader functions to be stopped when no speed input is detected.
- Added the PWM mode and functionality to allow for the user of the system with 3 ohm coils.
- Added a new version item that is used to indicate if the system contains the closed loop upgrade.

#### Issues Resolved:

- Fixed the displaying of the error messages when both the max number of files and an improper file name format was detected when importing calibration files.
- Fixed an issue that was not allowing the PreCise icon to display on the diagnostic screens.
- Fixed the backlight flicker issue. This could occur when the backlight was not set at 100% and the screen was being redrawn.
- Fixed an issue where the system falsely reported an aux flash failure after an error log corruption was detected.
- Fixed an issue where the SIM SPEED OFF warning text was not being cleared when the sim speed mode was turned back on after it was canceled due to the vehicle being moved.
- Fixed an issue where the hoist and plow functions would not run the outputs during calibration when any of the spreader outputs were being operated through the calibration menu.
- Modified the touch screen detection to eliminate the slow detection of a release of the touch screen.

#### Other Changes:

- Improved the PWM and touch screen code to use the atomic commands when setting latch and other special function register values. This will help reduce any future issues with interrupts.
- Adjusted the buttons to be two lines when the text was long and removed some of the abbreviations used in calibration.
- Updated the error numbers being reported in the event string to contain values other than 0 (no error).

### **5100ex Spreader Control Software (1.3), Released 2013-07-15**

#### New Features:

- New input diagnostic screen allowing for the viewing of the switch and input states.
- New output/operation diagnostic screen. Allows for the operation of the system while watching the related output settings.
- Added system time and distance logging.
- Added the error log with onscreen viewing and export capabilities. Can save the last 100 errors logged with system time.
- Added Operations Settings Failure on startup. Error is followed by the action text.
- Added action text for the corrupt data totals error, and corrupt cal settings to indicate what automatic action the controller took.
- Added the detection of a stuck touch screen and related error message.
- Added a new Improper Dashkey Wiring error.
- Added a new Hardware Settings error.
- Added a new calibration option for enabling clear jam separate from the auger reverse option.
- Added a new error for communication with the hardware port expander.

#### Issues Resolved:

- Saves the data totals prior to an upgrade to preserve totals acquired since startup to when the upgrade is performed.

#### Other Changes:

- Improved the exception errors to have a specific text message instead of a cryptic code
- Changed the saving of the nonvolatile info only if it was loaded. Corrects a production test issue with the wrong backlight value getting saved.
- Changed the default auger pulses per rev to 128.
- Changed the default parent for Spinner 1 to be Auger Forward.
- Added the ability to ignore the dashkey input for production testing.
- Added the ability to store a date of manufacture in the controller.

### **5100ex Spreader Control Software (1.2), Released 2013-06-12**

#### New Features:

- Added the ability to log the time, distance and displacement for each granular material and for the prewet material.
- Added the capability to use the Force America USB supervisor key for calibration access and data total clearing.

#### Other Changes:

- Added confirmation screens to the restore defaults, firmware upgrade and calibration import screens.

### **5100ex Spreader Control Software (1.1), Released 2013-05-20**

#### Issues Resolved:

- Corrected an issue where the auxiliary outputs when set to auger on or prewet on would not run during calibration.
- Corrected an issue where the calibration settings that affected some of the hardware items did not take effect after an import until a power down.

#### Other Changes:

- Lengthened the A2D acquisition time. (Should allow for more accurate A2D readings.)



- Resolved an issue with the stuck switch detection due to the input power being on the relay.

### **5100ex Spreader Control Software (1.0), Released 2013-04-24**

#### New Features:

- Added ability to run spinner in manual mode with the auger off. (Matches other Force America systems).
- Added clear jam functionality.
- Added software option upgrades for:
  - Closed loop
  - 5150
- Added 5150 functionality for hoist control and plow control with optional single acting float. Float has optional 3 second delay.
- Added guided "AutoCal" for setup of the granular and prewet material displacement rates and full speed displacement.
- Added simspeed operation.
- Added the gravity feed prewet operation mode.
- Added ability to switch cross auger direction during material unload.
- Added selectability for Inputs 3, 5, 6. (Added additional items to Inputs 1 and 2).
  - Off
  - Standby
  - Blast
  - Low Material
  - Low Prewet
  - Conveyor Stall
  - Filter Bypass
  - Oil Temp
  - Oil Level
- Added Low Prewet detection with variable action option of WARN or WARN & DISABLE.
- Added Low Material detection with variable action option of WARN or WARN & NO LOG.
- Added range error detection for the auger and prewet systems in both closed and open loop modes.
- Added adjustable alarm levels for the error conditions.
  - Off
  - Single Chirp
  - Single Beep
  - Continuous Beep
  - Solid Tone
- Added the ability to run the auxiliary output for a designated option.
  - Off
  - Standby (Active when the system is not in standby)
  - Auger On
  - Auger Forward (Opposite of the auger reverse switch state)
  - Auger Reverse (Mimics auger reverse switch state)
  - Prewet (Mimics prewet switch state)
  - Prewet On
  - Prewet Divert

#### Issues Resolved:

- Corrected the issue where the outputs when run in open or closed loop mode at very low vehicle speeds would toggle on and off by adding hysteresis to the movement detection.
- Corrected an issue where the actual rate values would briefly flicker when the actual rate remained the same and it was redrawn.

Other Changes:

- Improved the touchscreen detection.
- Improved touchscreen calibration by verifying touches are in the proper quadrant.
- Relocated the calibration and data buttons to a second menu pane.
- Added ability to have header bar warnings appear in yellow. (Errors can still appear in red).
- Changed the displayed serial number to also contain a checksum. This was necessary due to the possible manual entry associated with the option upgrades.