



# PLUS+1 Controls Function Block Library

## 70026747v400

### Revision History

This file contains important supplementary and late-breaking information that may not appear in the main product documentation. We recommend that you read this file in its entirety.

## Version 4.00 (June 2016)

### What is Included

- PLUS+1 GUIDE® Function Blocks (In SDL)
- User Manual (In SDL)
- Service Tool Log Screens

### What is New

- Support for Professional Licensing.
- Controller\_PID: Adjusted derivative function to use OS.ExecTime for Smpl Tm if Smpl Tm is lower. Increased accuracy of derivative sample calculation when Smpl Tm is not a multiple of OS.ExecTime.
- State\_Brake: Added initialization for Dec\_Tm to prevent output from following input when commanded direction changes rapidly after startup.

### Known issues

- None

### Minimum Requirements

- PLUS+1 GUIDE 8.1 or greater

## Version 3.00 (April 2014)

### What is Included

- PLUS+1 GUIDE® Function Blocks (In SDL)
- User Manual (In SDL)
- Service Tool Log Screens

### What is New

This library is a replacement for the controls functions found SD Basic FB Library (PN: 10103408).

- Companion service tool screens that can be imported to P1D files.
- Embedded checkpoints and namespace for each function block to support service tool integration.
- IO bus for alternative connectivity to your application.
- Requires specific data types for all inputs.
- Connection errors now indicate (by page name) which input has a problem.
- Ackermann
  - New block that combines both the speed and angle calculations.
- Ackermann\_Spd
  - Added Max Strg Ang output.
  - Combined Steering mode inputs into one signal.
- Ackermann\_Strg
  - Added Max Strg Ang output.
  - Combined Steering mode inputs into one signal.
- Controller\_PI
  - New block based on the latest version of the Controller\_PID, only without the differential calculation.
- Controller\_PID
  - Added Error and Saturate outputs.
  - Max/Min limits are now applied on the total output.
  - Integrator sum is now recalculated when either limit is reached.
  - Gains now have new ranges and scales. Refer to user manual for more information.
  - Integrator calculation now applies gain before integration, thus allowing for variable gains without unintended step changes in output.
  - I Stop feature added to prevent oscillations around the setpoint.
  - Derivative calculation replaced with one that allows adjustable sample time and includes averaging for more stable control.
- Hysteresis
  - Maximum input is now reduced from 40000 to 32767.
- Inverse\_Acker
  - New block that estimates a steering angle command from measured wheel angles.
- Profile\_6Pt
  - Output now set to zero when parameters are invalid.
- State\_Brake
  - Added Dwell option to force a pause when changing direction/crossing zero.
  - Added output for current state.
  - Added Split option for ramping to a stop at zero when changing direction/crossing zero.

## Known issues

- None

### **Minimum Requirements**

- PLUS+1 GUIDE 6.1 or greater

## **Support**

### **Web**

<http://powersolutions.danfoss.com/Products/MobileElectronics/index.htm>

### **Telephone**

**North America: Toll free number 1-888-50PLUS1 (1-888-507-5871)**

**Europe: +46 476-569 06**

### **E-mail**

[plus1helpdesk@danfoss.com](mailto:plus1helpdesk@danfoss.com)

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