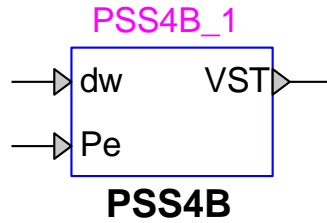


# Exciters and Governors: Power System Stabilizer PSS4B



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## 1 Description

This device is an implementation of the IEEE type PSS4B power system stabilizer model. This device is implemented as described in [1]. Implementation details can be viewed by inspecting the subcircuit of this device.

### 1.1 Pins

This device has 3 pins:

Pin name	Type	Description	Units
dw	Input	Speed deviation	pu
Pe	Input	Electrical power	pu
VST	Output	PSS output	pu

### 1.2 Parameters

The default set of parameters can be found in [1].

#### 1.2.1 Data tab

The parameters on the Data tab are:

1. **Filter frequency  $W_{n1}$** : first notch filter frequency
2. **Filter bandwidth  $B_{W1}$** : first notch filter 3 dB bandwidth
3. **Filter frequency  $W_{n2}$** : second notch filter frequency
4. **Filter bandwidth  $B_{W2}$** : second notch filter 3 dB bandwidth
5. **Gain  $K_L$** : low band gain
6. **Gain  $K_{L1}$** : low band differential filter gain
7. **Coefficient  $K_{L11}$** : low band first lead-lag block coefficient
8. **Time constant  $T_{L1}$** : low band numerator time constant

9. **Time constant  $T_{L2}$** : low band numerator time constant
10. **Time constant  $T_{L3}$** : low band numerator time constant
11. **Time constant  $T_{L4}$** : low band numerator time constant
12. **Time constant  $T_{L5}$** : low band numerator time constant
13. **Time constant  $T_{L6}$** : low band numerator time constant
14. **Gain  $K_{L2}$** : low band differential filter gain
15. **Coefficient  $K_{L17}$** : low band first lead-lag block coefficient
16. **Time constant  $T_{L7}$** : low band numerator time constant
17. **Time constant  $T_{L8}$** : low band numerator time constant
18. **Time constant  $T_{L9}$** : low band numerator time constant
19. **Time constant  $T_{L10}$** : low band numerator time constant
20. **Time constant  $T_{L11}$** : low band numerator time constant
21. **Time constant  $T_{L12}$** : low band numerator time constant
22. **Low band upper limit  $V_{Lmax}$** : low band upper limit
23. **Low band lower limit  $V_{Lmin}$** : low band lower limit
24. **Gain  $K_i$** : intermediate band gain
25. **Gain  $K_{i1}$** : intermediate band differential filter gain
26. **Coefficient  $K_{i11}$** : intermediate band first lead-lag block coefficient
27. **Time constant  $T_{i1}$** : intermediate band numerator time constant
28. **Time constant  $T_{i2}$** : intermediate band numerator time constant
29. **Time constant  $T_{i3}$** : intermediate band numerator time constant
30. **Time constant  $T_{i4}$** : intermediate band numerator time constant
31. **Time constant  $T_{i5}$** : intermediate band numerator time constant
32. **Time constant  $T_{i6}$** : intermediate band numerator time constant
33. **Gain  $K_{i2}$** : intermediate band differential filter gain
34. **Coefficient  $K_{i17}$** : intermediate band first lead-lag block coefficient
35. **Time constant  $T_{i7}$** : intermediate band numerator time constant
36. **Time constant  $T_{i8}$** : intermediate band numerator time constant
37. **Time constant  $T_{i9}$** : intermediate band numerator time constant
38. **Time constant  $T_{i10}$** : intermediate band numerator time constant
39. **Time constant  $T_{i11}$** : intermediate band numerator time constant
40. **Time constant  $T_{i12}$** : intermediate band numerator time constant
41. **Low band upper limit  $V_{Imax}$** : intermediate band upper limit
42. **Low band lower limit  $V_{imin}$** : intermediate band lower limit
43. **Gain  $K_H$** : high band gain
44. **Gain  $K_{H1}$** : high band differential filter gain
45. **Coefficient  $K_{H11}$** : high band first lead-lag block coefficient
46. **Time constant  $T_{H1}$** : high band numerator time constant
47. **Time constant  $T_{H2}$** : high band numerator time constant
48. **Time constant  $T_{H3}$** : high band numerator time constant
49. **Time constant  $T_{H4}$** : high band numerator time constant
50. **Time constant  $T_{H5}$** : high band numerator time constant
51. **Time constant  $T_{H6}$** : high band numerator time constant
52. **Gain  $K_{H2}$** : high band differential filter gain
53. **Coefficient  $K_{H17}$** : high band first lead-lag block coefficient
54. **Time constant  $T_{H7}$** : high band numerator time constant
55. **Time constant  $T_{H8}$** : high band numerator time constant
56. **Time constant  $T_{H9}$** : high band numerator time constant
57. **Time constant  $T_{H10}$** : high band numerator time constant
58. **Time constant  $T_{H11}$** : high band numerator time constant
59. **Time constant  $T_{H12}$** : high band numerator time constant
60. **Low band upper limit  $V_{Hmax}$** : high band upper limit
61. **Low band lower limit  $V_{Hmin}$** : high band lower limit
62. **Maximum PSS output  $V_{STMAX}$** : maximum PSS output
63. **Minimum PSS output  $V_{STMIN}$** : minimum PSS output
64. **Inertia constant  $H$** : Inertia constant

## **2 Initial conditions**

The initial output signal is zero from the steady-state solution.

## **3 References**

- [1] "IEEE Recommended Practice for Excitation System Models for Power System Models for Power System Stability Studies," IEEE Standard 421.5-2005.