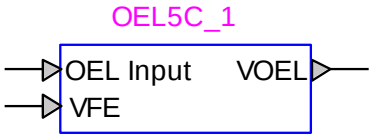
Exciters and Governors: Over Excitation Limiter OEL5C



OEL5C

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1 Description

This device is an implementation of the IEEE type OEL5C takeover over excitation limiter 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
OEL Input	Input	Generator field current or generator field voltage or exciter field current	pu
VFE	Input	Exciter field current	pu
VOEL	Output	Over Excitation Limiter signal	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. **Pickup level I_{FDpu}**: OEL inverse time integrator pickup level
2. **Active level I_{FDlim}**: OEL inverse time limit active level
3. **Upper limit $V_{OELmax1}$**: OEL inverse time upper limit
4. **Time constant T_{OEL}**: OEL inverse time integrator time constant
5. **Gain K_{IFDT}**: OEL inverse time leak gain
6. **Gain K**: OEL lead-lag gain
7. **Time constant T_{COEL}**: OEL lead time constant
8. **Time constant T_{DOEL}**: OEL lag time constant
9. **Pickup level $I_{FDpulev}$**: OEL activation logic pickup level

10. **Timer setpoint T_{IFDlev}**: OEL activation logic timer setpoint
11. **Reference 1 I_{FDref1}**: OEL reference 1
12. **Reference 2 I_{FDref2}**: OEL reference 2
13. **Gain K_{POEL}**: OEL proportional gain
14. **Gain K_{IOEL}**: OEL integral gain
15. **Maximum output V_{OELmax}**: OEL PI control upper limit
16. **Minimum output V_{OELmin}**: OEL PI control lower limit
17. **Gain K_{Pvfe}**: exciter field current regulator proportional gain
18. **Gain K_{Ivfe}**: exciter field current regulator integral gain
19. **Maximum output V_{VFEmax}**: exciter field current regulator upper limit
20. **Minimum output V_{VFEmin}**: exciter field current regulator lower limit
21. **Scaling factor K_{SCALE1}**: OEL input signal scaling factor
22. **Time constant T_{F1}**: OEL input transducer time constant
23. **Scaling factor K_{SCALE2}**: exciter field current scaling factor
24. **Time constant T_{F2}**: exciter field current transducer time constant
25. **Field current setpoint V_{FEref}**: exciter field current reference setpoint
26. **Reference bias I_{bias}**: OEL reference bias
27. **Exponent K_1**: exponent for inverse time function
28. OEL Reference Logic Switch option: see explanations below.

There are two possible selections for the OEL Reference Logic Switch option:

1. Static excitation system or brushless system.
2. Rotating exciters with collector rings.

2 Initial conditions

The OEL is supposed to be inactive during the steady-state conditions.

3 References

[1] “IEEE Recommended Practice for Excitation System Models for Power System Models for Power System Stability Studies,” IEEE Standard 421.5-2016.