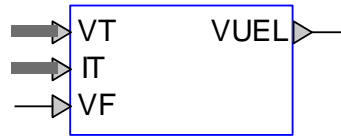


# Exciters and Governors: Under Excitation Limiter UEL1



**Under Excitation Limiter UEL1**

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## 1 Description

This device is an implementation of the IEEE type UEL1 under 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 4 pins:

Pin name	Type	Description	Units
VT	Input, bundle	Bundle signal of generator stator terminal voltage (magnitude and phase angle)	pu
IT	Input, bundle	Bundle signal of generator current (magnitude and phase angle)	pu
VF	Input	Signal from the excitation system stabilizer	pu
VUEL	Output	Under 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. **Radius setting  $K_{UR}$** : UEL radius setting
2. **Maximum radius phasor magnitude  $V_{URmax}$** : The maximum limit for the radius phasor magnitude
3. **Center setting  $K_{UC}$** : UEL center setting
4. **Maximum operating point phasor magnitude  $V_{UCmax}$** : The maximum limit for the operating point phasor magnitude

5. **Excitation system stabilizer gain  $K_{UF}$** : UEL excitation system stabilizer gain

## 1.2.2 Controller tab

The controller tab allows to input:

1. **UEL integrator gain  $K_{UI}$** : integrator gain
2. **UEL integrator gain  $K_{UL}$** : proportional gain
3. **UEL lead time constant  $T_{U1}$** : lead time constant
4. **UEL lead time constant  $T_{U3}$** : lead time constant
5. **UEL lag time constant  $T_{U2}$** : lag time constant
6. **UEL lag time constant  $T_{U4}$** : lag time constant
7. **UEL integrator maximum output  $V_{UImax}$** : integrator maximum output
8. **UEL integrator maximum output  $V_{UImin}$** : integrator minimum output
9. **UEL integrator maximum output  $V_{ULmax}$** : UEL maximum output
10. **UEL integrator maximum output  $V_{ULmin}$** : UEL minimum output

## 2 Initial conditions

The UEL 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 421.5-2005.