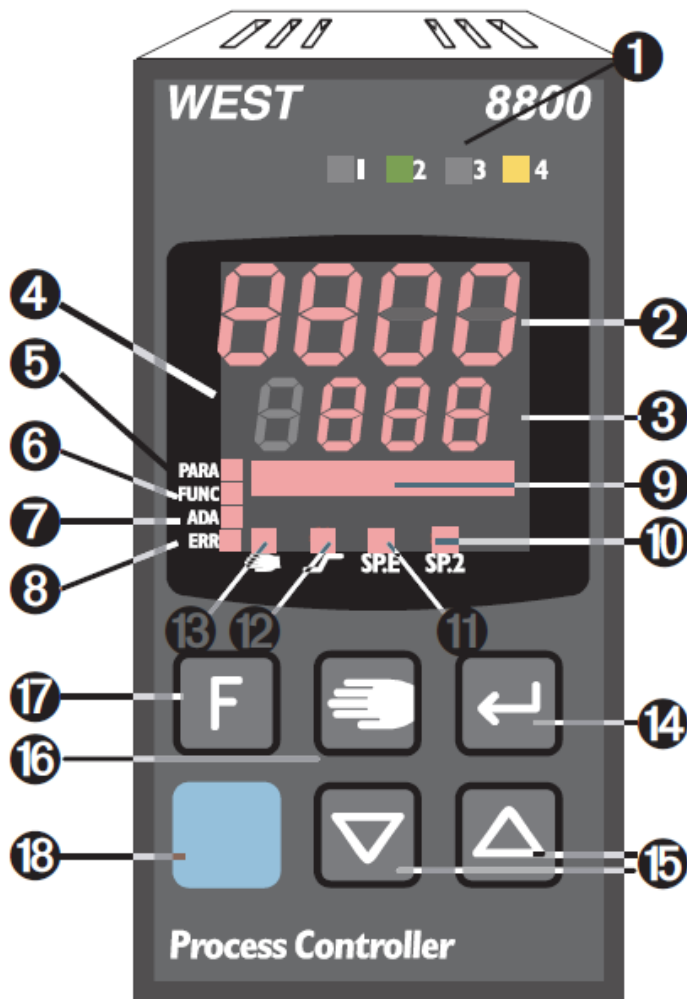


N8800 controller



- 1 Status of switching outputs
OuT.1... 6
- 2 Process value display
- 3 Set-point, controller output
- 4 Signals display on °C or °F
- 5 Signals **ConF** and **PArA** level
- 6 Signals active function key
- 7 Self-tuning active
- 8 Entry in error list
- 9 Bargraph or clear text display
- 10 SP.2 is effective
- 11 SP.E is effective
- 12 Set-point gradient effective
- 13 Manual/automatic switch-over:
Off: Automatic
On: Manual (changing possible)
Blinks: Manual (changing not possible
(r **ConF/Cntr/nAn**)
- 14 Enter key: calls up extended operating level/error list
- 15 Up/down keys: changing the set-point or the controller output value
- 16 Manual mode /spec. function
(→ **ConF/LOGI**)
- 17 Freely programmable function key
- 18 PC connection for 800/8840 configurator (engineering tool)


LED colours:

LED 1, 2, 3, 4: yellow



Bargraph: red

other LEDs: red

Error list/Maintenance manager

With one or several errors, the extended operating level always starts with the error list. Signalling an actual entry in the error list (alarm, error) is done by the **Err** LED in the display. To reach the error list, press  twice.

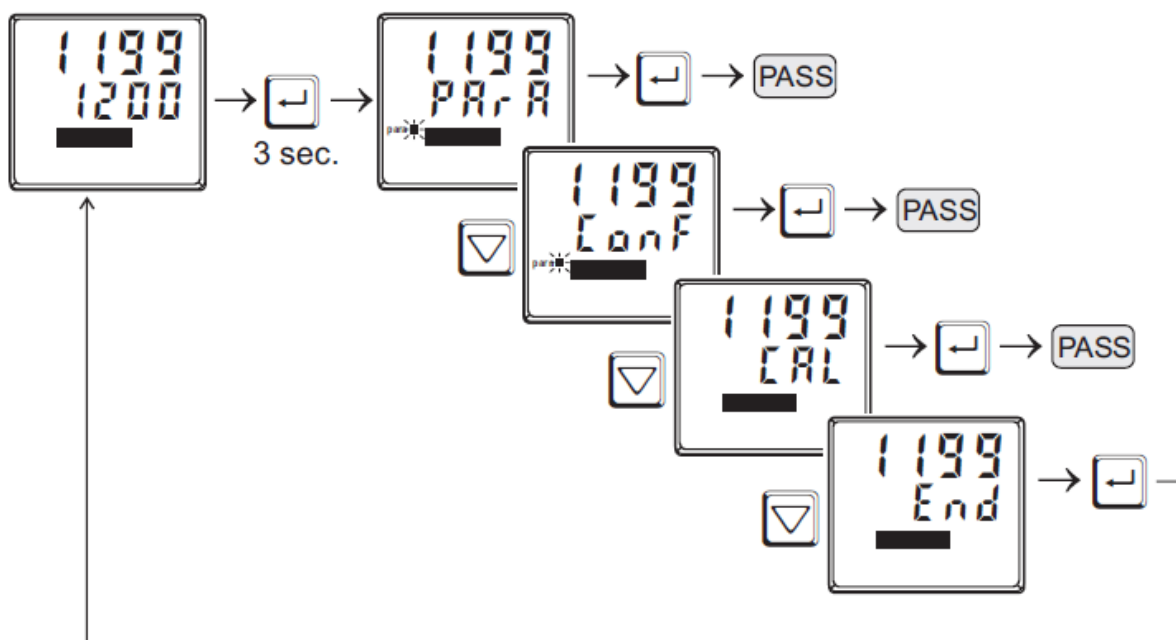


Err LED status	Signification	Proceed as follows
blinks (status 2)	Alarm due to existing error	- Determine the error type in the error list - After error correction the unit changes to status 1
Lit (status 1)	Error removed, alarm not acknowledged	- Acknowledge the alarm in the error list pressing key  or 

Err LED status	Signification	Proceed as follows
		- The alarm entry was deleted (status 0).
off (status 0)	No error, all alarm entries deleted	- Not visible except when acknowledging

Operating structure

After supply voltage is switched-on, the controller starts with the operating levels. The controller status is as before power off.







PARA - level: At **PARA** - level, the right decimal point of the bottom display line is lit continuously.

CONF - level: At **CONF** - level, the right decimal point of bottom display line blinks.

Configuration setting level

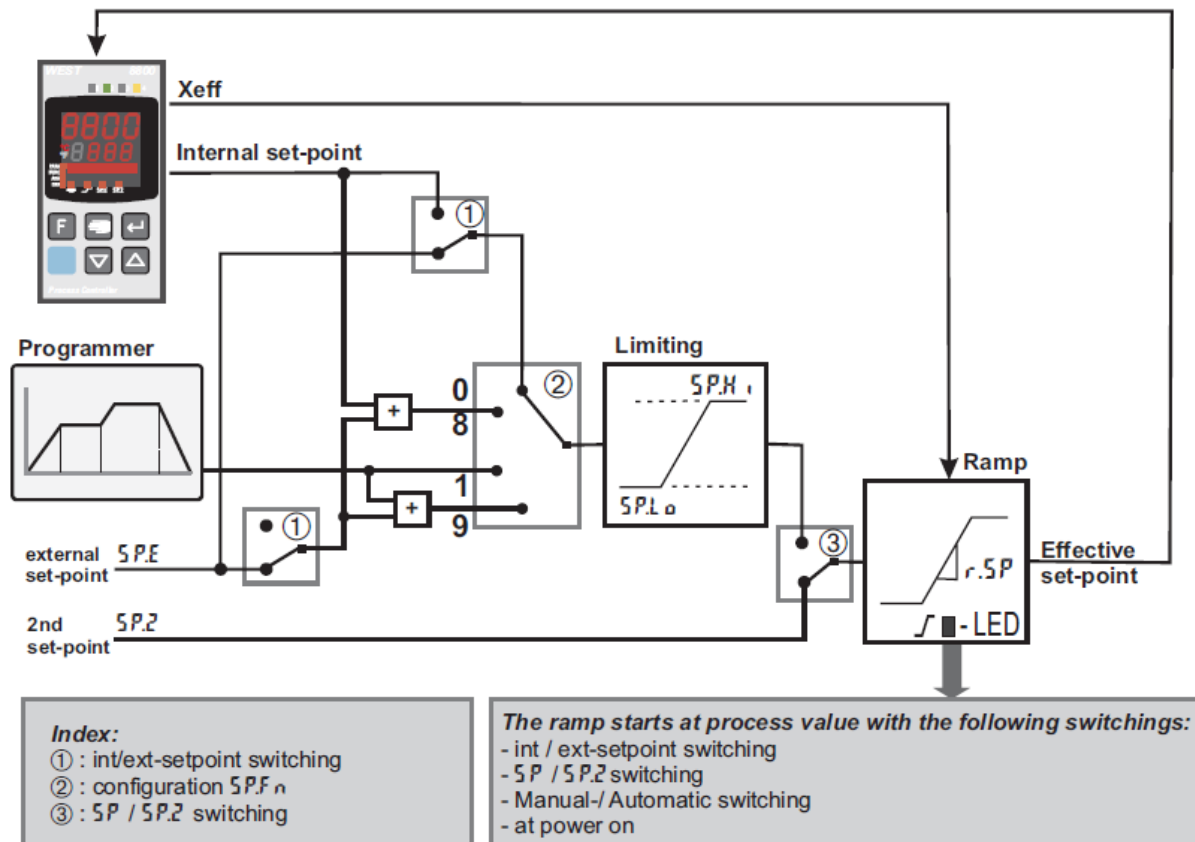
Adjustment:

1. The configuration can be adjusted by means of keys  and .
2. Transition to the next configuration is by pressing key .
3. After the last configuration of a group, **done** is displayed and followed by automatic change to the next group.

Return to the beginning of a group is by pressing the  key for 3 sec.

Set-point processing

The set-point processing structure is shown in the following picture:






Set-point gradient/ramp


To prevent set-point step changes, parameter → set-point → **r.SP** can be adjusted to a maximum rate of change. This gradient is effective in positive and negative direction.

With parameter **r.SP** set to **OFF** (default), the gradient is switched off and set-point changes are realized directly.

Parameter setting level

Adjustment:



1. The parameters can be adjusted by means of keys  and .
2. Transition to the next parameter is by pressing key .
3. After the last parameter of a group, **donE** is displayed, followed by automatic change to the next group.

Return to the beginning of a group is by pressing the  key for 3 sec.

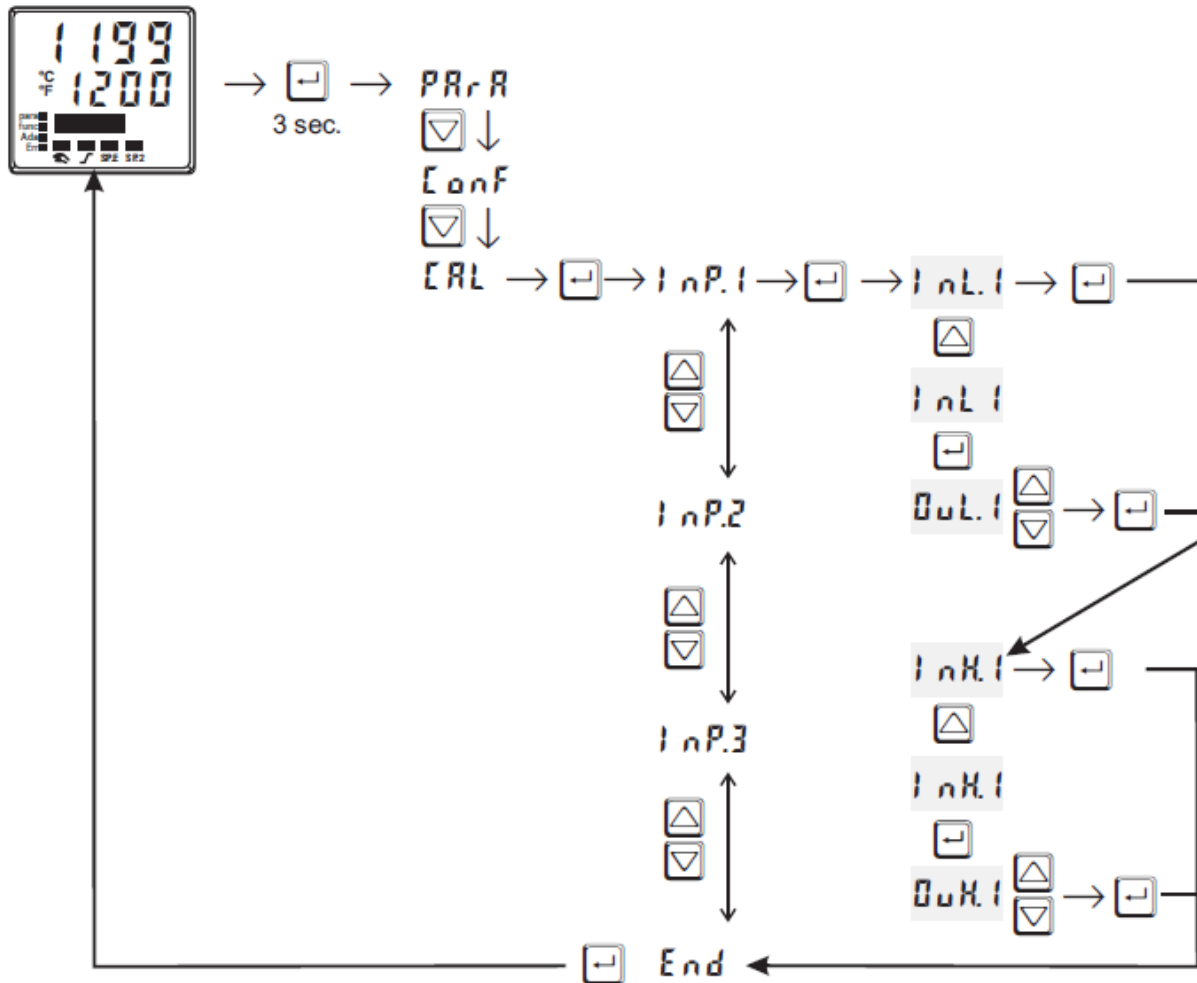
If for 30 sec. no keypress is executed, the controller returns to the process value and setpoint display (Time Out = 30 sec.).

Adjusting the Setpoint

Setpoint can be adjusted within the limits set by the **Setpoint High (SP.Hi)** and **Setpoint Low (SP.Lo)** parameters, in **Setting Parameters/SEtP** mode. Direct adjustment of **Setpoint** is possible by pressing

 or  to adjust the setpoint to the required value. **SP.Lo** and **SP.Hi** should be within the limits of **rnGH** and **rnGL** that can be adjusted, in turn, in the **Configuration Parameters/Cntr** mode.

2-point correction (ConF/ InP.1/Corr = 2):



InL.1: The input value of the lower scaling point is displayed. The operator must adjust the lower input value by means of a process value simulator and confirm the input value by pressing key

OuL.1: The display value of the lower scaling point is displayed. Before calibration, **OuL.1** equals **InL.1**. The operator can correct the lower display value by pressing the keys. Subsequently, he confirms the display value by pressing key .

InH.1: The input value of the upper scaling point is displayed. The operator must adjust the upper input value by means of the process value simulator and confirm the input value by pressing key .

OuH.1: The display value of the upper scaling point is displayed. Before calibration **OuH.1** equals **InH.1**. The operator can correct the upper display value by pressing keys . Subsequently, he confirms the display value by pressing key .

The parameters (**OuL.1**, **OuH.1**) changed at **CAL** level can be reset by adjusting the parameters below the lowest adjustment value (**OFF**) by means of decrement key .

Self-tuning

For determination of optimum process parameters, self-tuning is possible.

After starting by the operator, the controller makes an adaptation attempt, whereby the process characteristics are used to calculate the parameters for fast line-out to the set-point without overshoot.

The following parameters are optimized when self-tuning:

Parameter set 1:

Pb1 - Proportional band 1 (heating) in engineering units [e.g. °C]

ti1 - Integral time 1 (heating) in [s]

→ only, unless set to OFF

td1 - Derivative time 1 (heating) in [s]

→ only, unless set to OFF

t1 - Minimum cycle time 1 (heating) in [s]

→ only, unless Adt0 was set to “no self-tuning” during configuration by means of 8800/8840 configurator®.

Pb2 - Proportional band 2 (cooling) in engineering units [e.g. °C]

ti2 - Integral time 2 (cooling) in [s]

→ only, unless set to OFF

td2 - Derivative time 2 (cooling) in [s]

→ only, unless set to OFF

t2 - Minimum cycle time 2 (cooling) in [s]

→ only, unless Adt0 was set to “no self-tuning”

Preparation for self-tuning

1. Adjust the controller measuring range as control range limits. Set values **rnG.L** and **rnG.H** to the limits of subsequent control.

(Configuration → Controller → lower and upper control range limits)

ConF → **Cntr** → **rnG.L** and **rnG.H**

2. Determine which parameter set shall be optimized.
The instantaneously effective parameter set is optimized.
→ Activate the relevant parameter set (1 or 2).
3. Determine which parameter set shall be optimized.
4. Select the self-tuning method:
 - Step attempt after start-up
 - Pulse attempt after start-up
 - Optimization at the set-point



Self-tuning start

Start condition:

1. For process evaluation, a stable condition is required. Therefore, the controller waits until the process has reached a stable condition after self-tuning start. The rest condition is considered being reached, when the process value oscillation is smaller than ± 0,5% of (**rnG.H** - **rnG.L**).
2. For self-tuning start after start-up, a 10% difference from (**SP.LO** - **SP.Hi**) is required.

Self-tuning start can be blocked via 8800/8840 configurator® (engineering tool) (**P.Loc**).



Strt = 0 Only manual start by pressing keys  and  simultaneously or via interface is possible.

Strt = 1 Manual start by press keys  and  simultaneously via interface and automatic start after power-on and detection of process oscillations.

Ada LED status	Signification
blinks	Waiting, until process calms down
lit	Self-tuning is running
off	Self-tuning not active or ended

Self-tuning cancellation



By the operator:

Self-tuning can always be cancelled by the operator. For this, press  and  key simultaneously. With controller switch-over to manual mode after self-tuning start, self-tuning is cancelled. When self-tuning is cancelled, the controller will continue operating using the old parameter values.

By the controller:

If the **Err** LED starts blinking whilst self-tuning is running, successful self-tuning is prevented due to the control conditions. In this case, self-tuning was cancelled by the controller. The controller continues operating with the old parameters in automatic mode. In manual mode it continues with the old controller output value.


Acknowledgement procedures in case of unsuccessful self-tuning

1. Press keys  and  simultaneously:

The controller continues controlling using the old parameters in automatic mode. The **Err** LED continues blinking, until the self-tuning error was acknowledged in the error list.

2. Press key  (if configured):

The controller goes to manual mode. The **Err** LED continues blinking, until the self-tuning error was acknowledged in the error list.

3. Press key :

Display of error list at extended operating level. After acknowledgement of the error message, the controller continues control in automatic mode using the old parameters.