

Limits (Common Properties of Control Windows (HI /Monitoring and Controlling of D2000 System Objects))

Value limit describes the status of the value with regard to its defined limits. Limit values are always defined within the configuration of particular object or structure item.

Limits are logically defined only for selected object types and also for selected object value types.

D2000 system defines four limits: **VHL**, **HL**, **LL** and **VLL**. The limit can be defined either directly - by entering a value or its value can be defined by a system object (dynamic limit) - the button right from the input field.

VHL	Very High Limit - the highest limit
HL	High Limit - high limit
LL	Low Limit - low limit
VLL	Very Low Limit - the lowest limit

Values of individual limits determine the state of the object value according to its value. The relation object value - limits gives 6 possible states.

Limit	Object status according to the relation <i>Object value - Limit</i>
	Above VHL (object value > VHL)
VHL	
	Above HL (HL < object value < VHL)
HL	
	Normal (LL ≤ object value ≤ HL)
LL	
	Below LL (VLL ≤ object value < LL)
VLL	
	Below VLL (object value < VLL)

Since the limits can be dynamic, i.e. determined by the object value (real or integer type), a situation may occur when the relation $VLL < LL < HL < VHL$ is not valid (limit crossing). Then, the object value is in the status **Limits Problem**.

Hysteresis

This is configuration of the hysteresis relating to the limits defined for the object value. The hysteresis value (in %) is determined by the difference $|\text{VHL} - \text{VLL}|$. Hysteresis has effect on the evaluation of limit states of the object. Hysteresis is demonstrated in the following figure.

The object value is in the status InLimit. This value exceeds the limit HL (we assume that the object value will not exceed the level $\text{HL} + \text{HYSTERESIS}$ - it is within the red-colored area in the figure). The value status is still InLimit. The system assigns the value status HL to the object as soon as the value exceeds the level $\text{HL} + \text{HYSTERESIS}$ (the value is above the red-colored area in the figure). This is also valid when the value is decreasing. The value gets the status InLimit as soon as it falls below the level $\text{HL} - \text{HYSTERESIS}$ (the value is below the red-colored area in the figure).

