


# FUNCTIONAL DESCRIPTION

## AOC01

### Analog Operator Control

Prep.	10-11-30	Function Description			No. of p.				
Appr.	PA/R/ Bengt Persson	Approved	AOC01 Functional Description		18				
Resp. dept.									
	ABB AB	Doc. no.	3AST 001 596D006	Lang.	en	Rev. ind.	J	Page	1

**Contents**

<b>1</b>	<b>General</b> .....	<b>4</b>
<b>2</b>	<b>Configuration</b> .....	<b>4</b>
<b>3</b>	<b>Function Block AOC01</b> .....	<b>5</b>
<b>4</b>	<b>AOC01 Datatypes</b> .....	<b>6</b>
4.1	AOC01_InPar.....	6
4.2	AOC01_OutPar.....	6
4.3	AOC01_Opr.....	6
<b>5</b>	<b>Function</b> .....	<b>7</b>
5.1	Basic Properties.....	7
5.2	Control Modes and Updating.....	7
5.2.1	E1.....	7
5.2.2	Manual.....	7
5.3	Scaling and Engineering Units.....	7
5.4	Limit check.....	8
5.5	Event Handling.....	8
5.6	Process connections.....	8
5.7	Interaction Window.....	8
5.7.1	AOC01 Interaction Window.....	8
5.7.2	General Parameters.....	8
5.7.3	Units and Range.....	9
5.7.4	Limits & Settings.....	9
5.7.5	Orders and Event.....	9
5.7.6	Text.....	10
<b>6</b>	<b>Operator Functions</b> .....	<b>11</b>
6.1	Presentation.....	11
6.1.1	Display Elements.....	11
6.1.2	Time-logged Properties.....	12
6.2	Faceplate(Dialog).....	14
6.3	Alarm and Event Handling.....	15
6.3.1	General.....	15
6.3.2	Event Handling.....	16
6.4	Faceplate tabs.....	16
6.4.1	Blocking.....	16
6.4.2	Order Blocking.....	16
6.4.3	Limits.....	17
6.4.4	Info.....	17



## 1 General

AOC01 is a functional unit for analog operator control in Control<sup>IT</sup>, to be operated from Operate<sup>IT</sup>, Operator Station. An AOC01 normally performs a complete function independently.

AOC01 has the following functions and properties:

- Different control modes, set by operator or by control logic.
- Limiting of output signal.
- Function for bumpless change between different control modes.
- Alarm and event handling of important control signals.

## 2 Configuration

AOC01 comprises a function block type for control and logic functions in Control<sup>IT</sup>, a faceplate and an object display in Operate<sup>IT</sup> for operator functions and control parameters.

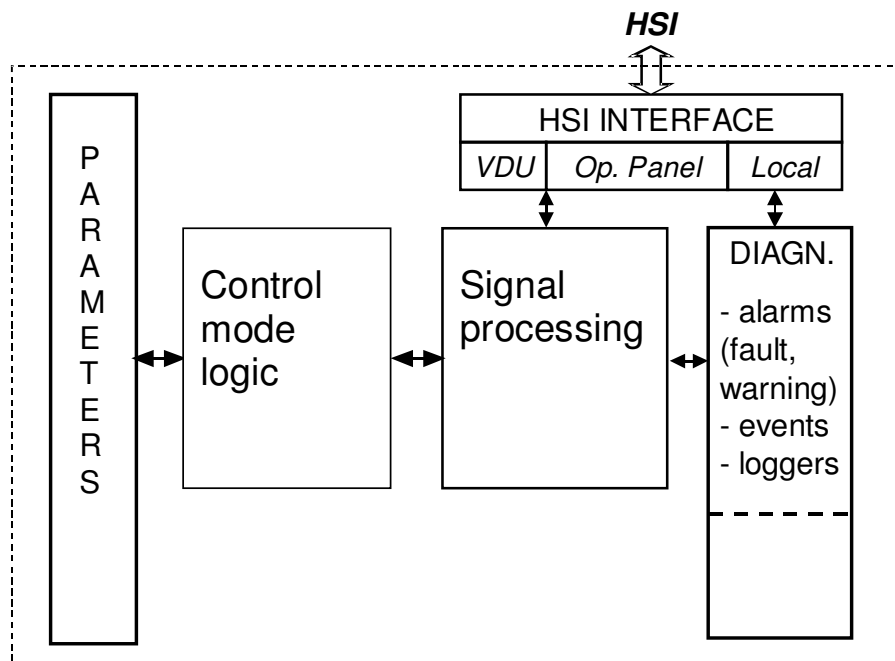


Figure 1. The Structure of the Functional Unit

### 3 Function Block AOC01

FUNCTION OF INPUT TERMINALS	AOC01		FUNCTION OF OUTPUT TERMINALS
Object name	Name	Value	Value
Object description	Description	Man	Man mode
Enable object	Enable	E1	E1 mode
E1 Reference	MV	Out_EQ_HL	Output greater than or equal to High Limit
Order mode to Man	SeqMan	Out_EQ_LL	Output less than or equal to Low Limit
Order mode to E1	SeqE1	OutPar	Out Parameter
In Parameter	InPar	Opr	Operator order
Event name	EventName	Value	Value

Figure 3-1. Function Block Type, Complete symbol

Table 3-1 below illustrates the default properties of each terminal of the AOC01 function block.

Name	Data Type	Attributes	Direction	FD Port	Initial value	Description
Name	string	coldretain	in	yes	'AOC01'	Object name
Description	string	coldretain	in	yes	'Descr'	Object description
Enable	bool	coldretain	in	yes	true	Enable object
MV	real	retain	in	yes		E1 Reference
SeqMan	bool	retain	in	yes		Order mode to Man
SeqE1	bool	retain	in	yes		Order mode to E1
InPar	AOC01_InPar	by_ref	in	yes		In Parameter
EventName	string	coldretain	in	yes	'  AOC01_'	Event name
Value	real	retain	out	yes		Value
Man	bool	retain	out	yes		Man mode
E1	bool	retain	out	yes		E1 mode
Out_EQ_HL	bool	retain	out	yes		Output greater than or equal to High Limit
Out_EQ_LL	bool	retain	out	yes		Output less than or equal to Low Limit
OutPar	AOC01_OutPar	by_ref	out	yes		Out Parameter
Opr	AOC01_Opr	by_ref	out	yes		Operator order

Table 3-1. Terminal properties.

## 4 AOC01 Datatypes

### 4.1 AOC01\_InPar

Name	Data Type	Attributes	Initial value	ISP value	Description
Class	dint	coldretain	500		AE class
Severity	dint	coldretain	1000		AE severity
Range	RangeReal	coldretain			Range
OUTLimit	RangeLimit	coldretain			OUT limit
InitMode	dint	coldretain	5		Init mode (5 = Man ; 7 = E1)
ManBlk	bool	coldretain	false		Block operator order Man mode
E1Blk	bool	coldretain	false		Block operator order E1 mode
SeqManEvBlk	bool	coldretain	true		Block event for SeqMan
SeqE1EvBlk	bool	coldretain	true		Block event for SeqE1
EnOUTLimH	bool	coldretain	false		Enable OUT Limit High
EnOUTLimL	bool	coldretain	false		Enable OUT Limit Low

### 4.2 AOC01\_OutPar

Name	Data Type	Attributes	Initial value	ISP value	Description
Mode	dint	retain			Active mode
NormalMode	bool	retain			Normal mode (Active mode = Init mode)

### 4.3 AOC01\_Opr

Name	Data Type	Attributes	Initial value	ISP value	Description
Man	bool	retain			Operator order Manual mode
E1	bool	retain			Operator order E1 mode
ManOut	real	coldretain	0.0		Operator enter value

## 5 Function

### 5.1 Basic Properties

The AOC01 functional unit is designed for a analog operator control. Typically used by an operator to enter analog values into the control system.

AOC01 has the following basic functions:

- Control Modes and Updating.
- Scaling and Units.
- Output Limit Check.
- Operator Functions.

### 5.2 Control Modes and Updating

The analog signal is read at intervals determined by the controllers task scan-time. You should set scan time to the requirements of your system.

The control modes can individually be blocked for operator access.

#### 5.2.1 E1

E1 is the initial control mode of the AOC01, where the value is obtained from the I/O-module at input terminal :MV. The control mode E1 can be commanded from the operator's keyboard.

The control mode E1 is activated as follows:

- By clicking on the E1 button on the operator's faceplate. E1 is indicated on the object display and Faceplate.
- By another part of the program activating the terminal : SeqE1

#### 5.2.2 Manual

In this mode the operator directly sets the output value from the operator station.

The control mode MAN is activated as follows:

- By clicking on the Man button on the operator's faceplate. Man is indicated on the object display and Faceplate. A dialog entry window becomes available for the operator to enter the required value.
- By another part of the program activating the terminal : SeqMan.

### 5.3 Scaling and Engineering Units

All values are used in the system are represented as engineering units. By using the interaction window the Max, Min, Unit and Fraction (Decimal) values can be entered.

#### 5.4 Limit check

In the Limit check part of the function block you determine if a limit check will be performed. The result is always stored in the output terminals and is thus available to other programs.

#### 5.5 Event Handling

Event are generated for status change on the signals defined in interaction window in chapter 4.8.5

The layout of the event is described in chapter 5.3.2 Alarm and Event Handling .

All Operator Events are reported by Audit Trail Functionality and not included in the FunctionBlock.

The individual text string for each event is stored in the Alarm and Event Translator aspect. This text can be NLS handled.

#### 5.6 Process connections

The AOC01 is connected to the process via the following terminals:

- Value This is used for value entry into a program.

#### 5.7 Interaction Window

The interaction window is available in the Control<sup>IT</sup> Control Builder. The interaction window is an engineering aid used to simplify configuration and blocking of signals not available on the faceplates. Changes to values in the Interaction window are only available in 'Online' mode in Control<sup>IT</sup>.

##### 5.7.1 AOC01 Interaction Window

Interaction window overview. Name and description are shown. The buttons are links to sub-windows.

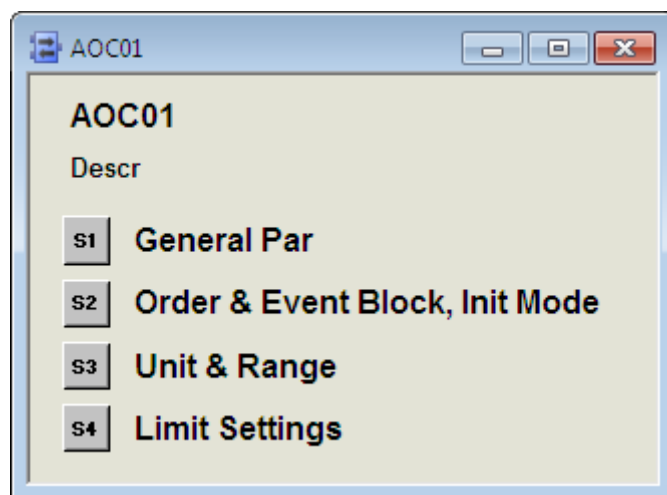


Figure 4-1 Main Interaction Window.

##### 5.7.2 General Parameters

“Class” defines the process section or area in which alarms are grouped. By utilizing class the alarms can be filtered. Valid values are user defined. A suggestion would be to use mill area numbers as class values.

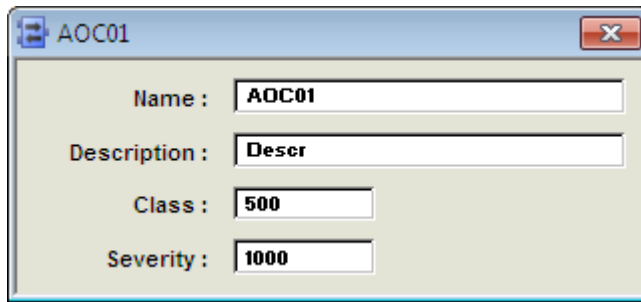


Figure 4-2 General Parameters.

### 5.7.3 Units and Range

Decimal resolution, engineering units and minimum and maximum range are shown in this window.

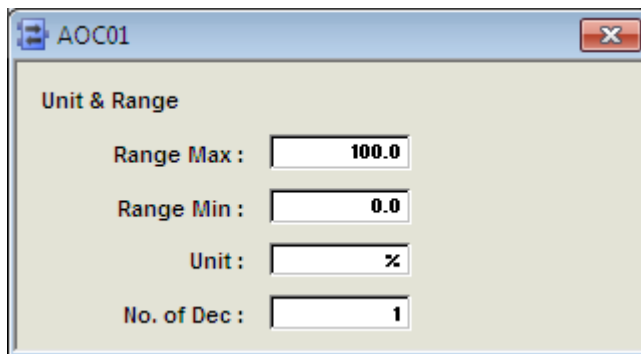


Figure 4-3 Units & Range.

### 5.7.4 Limits & Settings

Output limits, Name of control signal and Enabling of output limitation is entered in this window.

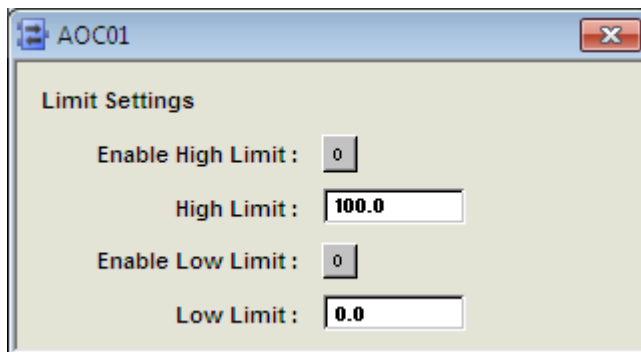


Figure 4-4 Limits & Settings.

### 5.7.5 Orders and Event

Order Block:

“Manual Mode” blocks the input signal. A value can then be entered from faceplate. Mode is Man.

“E1 mode” reads the input signal MV and displayed the value on the faceplate. Mode is E1.

A 1 will remove the possibility to select the mode form the faceplate

Init Mode define the mode of the object when is started in Cold start

Event Block is used for blocking the event message. A 1 will block the event message

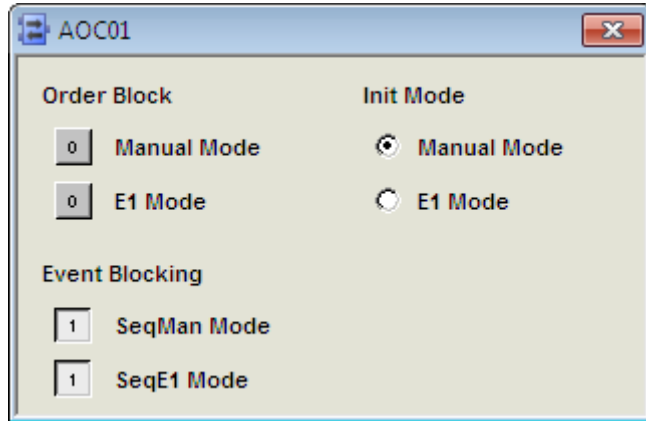


Figure 4-5 Orders and Event

5.7.6 Text

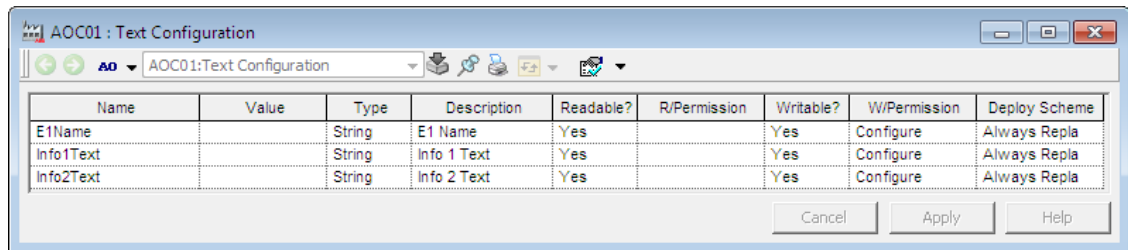


Figure 4-6 Text

## 6 Operator Functions

The Operator functions are divided in principle into 3 parts:

- Presentation (Display elements, Time logged properties)
- Faceplate (Dialog)
- Alarm and Event handling

### 6.1 Presentation

#### 6.1.1 Display Elements

Display elements, which can be used for different display types, are available for use in the functional unit AOC01.

The display elements show the status and the controls of the process with different degrees of detail and are intended for the following displays:

- Object display
- Process display

Examples of different display elements, which could be used, are given in the following sections.

##### 6.1.1.1 Object Display

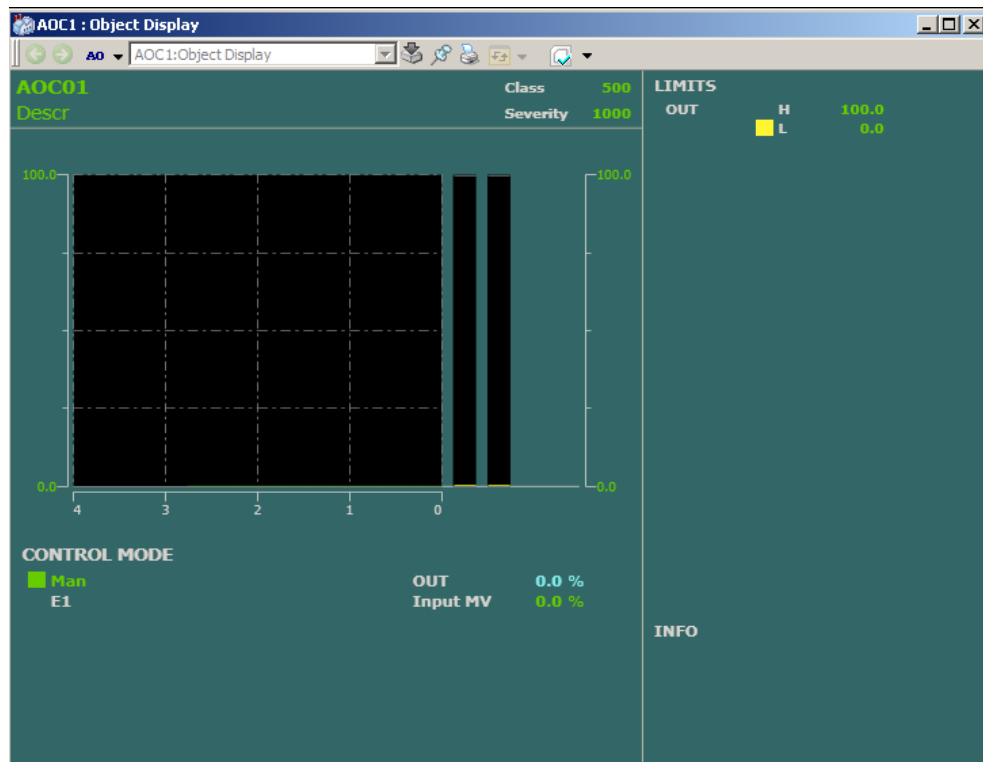


Figure 5-1 Object Display.

6.1.1.2 Process Display

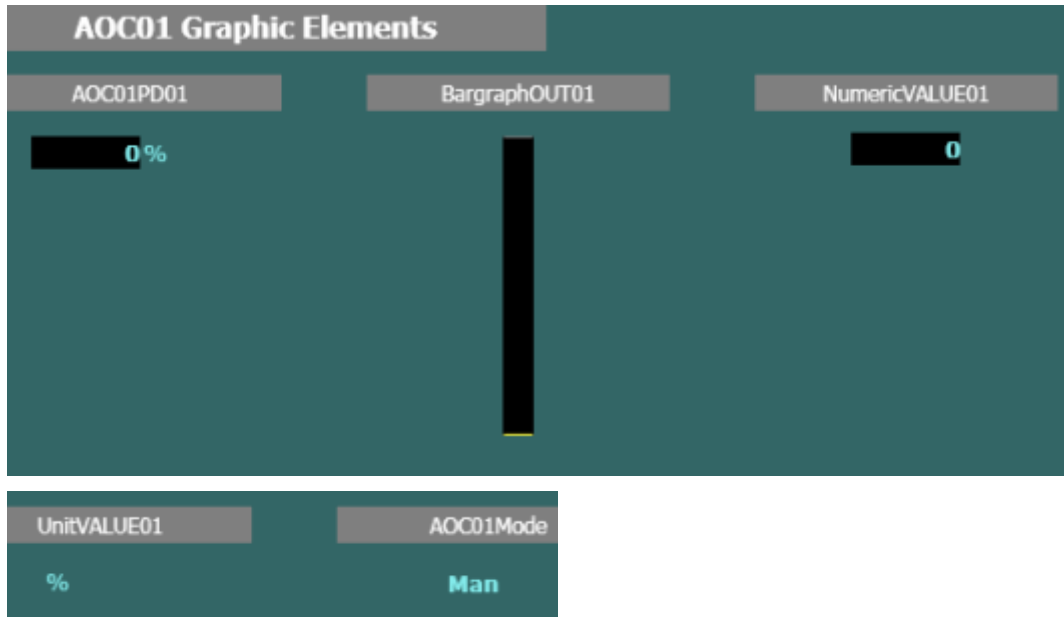


Figure 5-2 Process Display Elements.

6.1.2 Time-logged Properties

Output values stored can be presented graphically in the form of curves on the display screen. Such a display, a **Trend display**, can consist of 1- 4 curves as standard. All properties for the object AOC01 are available to be logged on the trend curves.

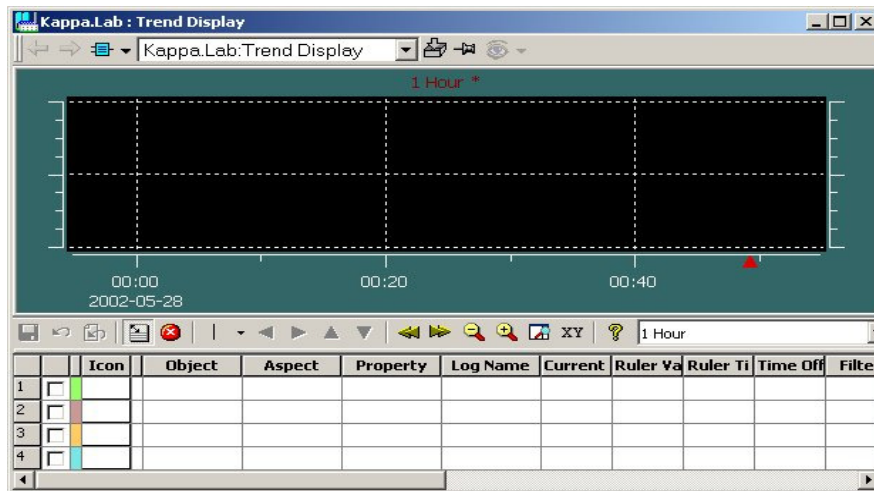


Figure 5-3 Trend Curve

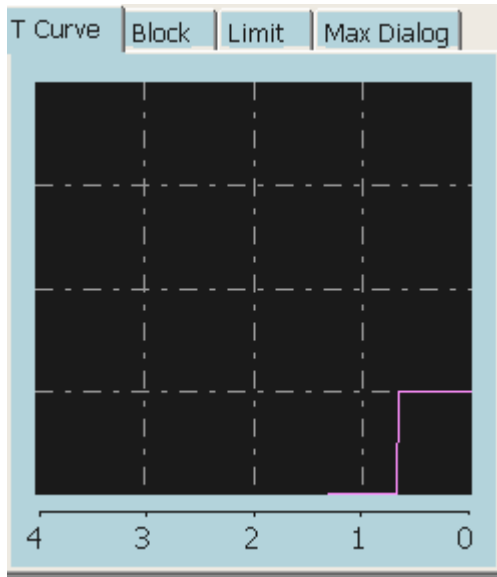


Figure 5-4 Extended Faceplate (T Curve)

## 6.2 Faceplate(Dialog)

The display screen is supplemented with a mouse and keyboard for operator communication with the functional unit/object.

By using Operate<sup>IT</sup> Operator Station the operator can view and control the process through faceplates. The dialogue consists of buttons, indicators and graphic presentations within a Faceplate. A faceplate has three levels of dialogue, which are presented by the following three runtime views:

- Reduced Faceplate, where the size and contents typically have been optimized to cover most of the normal process operator actions. Minimum dialogue. This is the default view.
- Faceplate, which typically covers all normal process operator actions. This view is disabled as default.
- Extended Faceplate, with functions and information intended for the process engineer or the advanced operator. Maximum dialogue.

The figures 5-5 to 5-7 below and overleaf illustrate the various presentations of the faceplate.

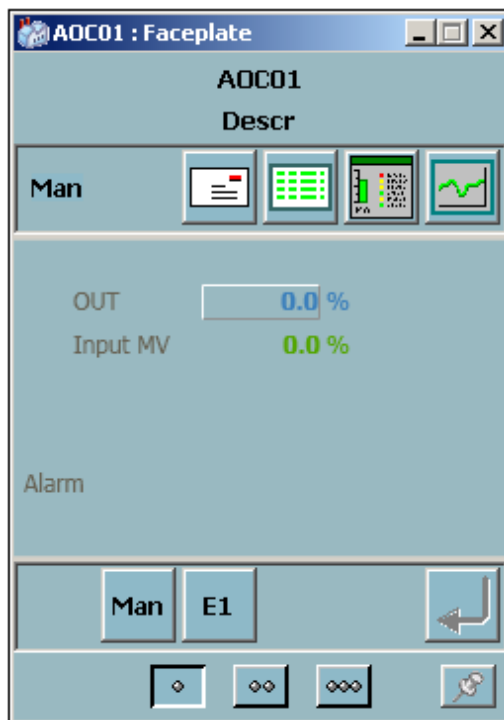


Figure 5-5 Reduced Faceplate.

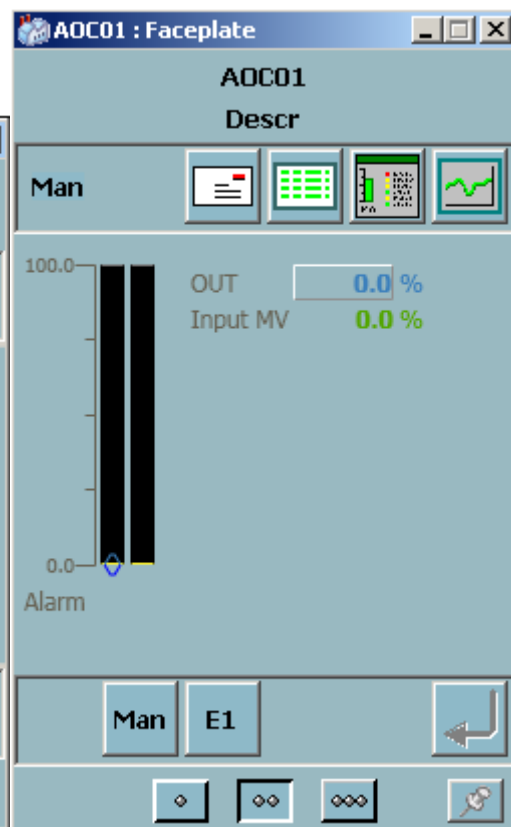


Figure 5-6 Faceplate.

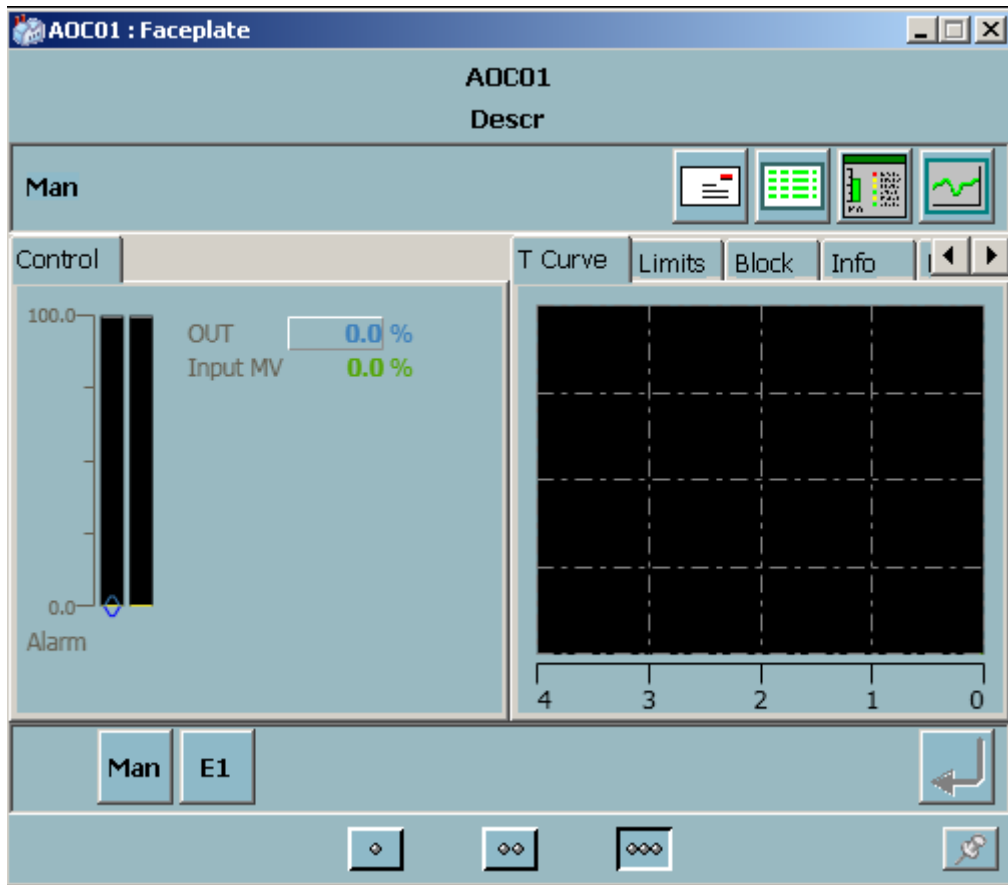


Figure 5-7 Extended Faceplate

### 6.3 Alarm and Event Handling

#### 6.3.1 General

This section contains a description of all alarms and events in the functional unit AOC01.

When a value changes an event is generated and can be viewed on the Operate<sup>IT</sup> Operator Station. The alarms are indicated in the faceplate, object display and in the alarm and event list.

AOC has no alarm handling except for OPC error functions.

Event Time	Object Name	Object Description	Condition	Message Description
02-05-25 18:58:42:685	500F1920	Washing Pulp Flow	AI_Err	Alarm
02-05-25 18:58:41:962	500F1920	Washing Pulp Flow	MV_L1	Alarm
02-05-25 18:58:41:962	500F1920	Washing Pulp Flow	MV_L2	Alarm
02-05-25 18:58:41:962	Mot01	Test Mot01	ControlV	Alarm
02-05-25 18:58:41:962	DIS		Status	Alarm
02-05-25 04:16:59:688	30		HWError	For info see 'Errors and W
02-05-25 04:16:58:689	192.168.0.51-0.11.5		HWError	For info see 'Errors and W
02-05-25 04:16:58:688	192.168.0.51-0.11.4		HWError	For info see 'Errors and W
02-05-25 04:16:58:687	192.168.0.51-0.11.3		HWError	For info see 'Errors and W

Figure 5-8 Alarm List

### 6.3.2 Event Handling

The following event texts are generated. The “Message Description” text are stored in the Alarm and Event Translator aspect and can be NLS handled.

SourceName	ObjectDescription	Condition	Message Description
<Name>	<Description>		SeqMan Mode
<Name>	<Description>		SeqE1 Mode

### 6.4 Faceplate tabs

#### 6.4.1 Blocking

Enabling of output limits function is indicated by the yellow limit indicator on the bar graph.

The check box “Enable Object”, is used to set the object out of service.

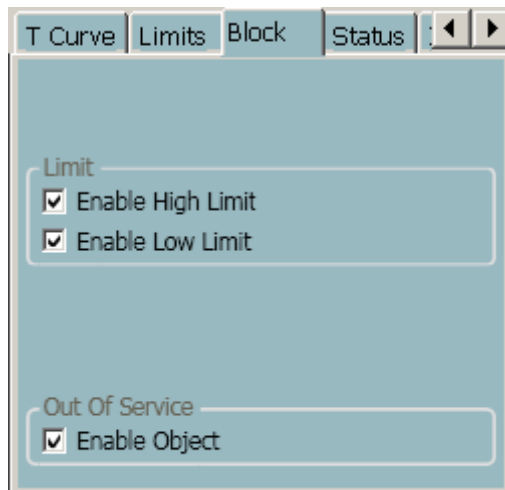


Figure 5-9 Extended Faceplate (Block)

#### 6.4.2 Order Blocking

By using the extended faceplate it is possible for the process engineer to limit the operator access to different control modes.

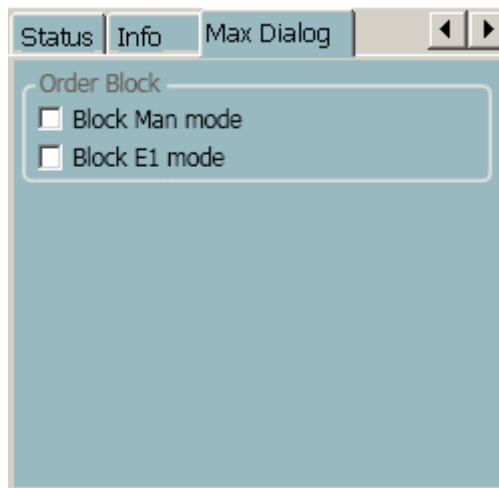


Figure 5-10 Extended Faceplate (Max Dialog)

### 6.4.3 Limits

By using the extended faceplate it is possible to adjust the limits for the output value. The faceplate elements in the extended faceplate below illustrate this.

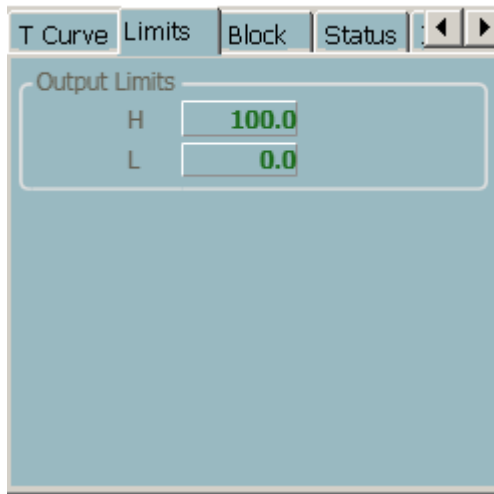


Figure 5-11 Extended Faceplate (Limit)

### 6.4.4 Info



Figure 5-12 Extended Faceplate (Info)

REVISION

Rev.	Page (P) Chapt. (C)	Description	Date Dept./Init.
A		Release 2.0	030130/MP
B		Orderblock added	031106/MP
C	5, 6	Initialization	040414/FM
D		Rev. 3.1/2	050223/MP
E	4,5	Event handling is added	050228/BP
F	5	Faceplate, Rev 4.0/1	05-08-26/MP
G	3	Rev 4.0/5	070510/BP
H		Rev 5.0-1	081230/BP
I	5.1.1.2	Update of Process Display	090909/BP
J		Update rev 5.1/0	101102/BP