Application Descriptions

HVAC ObIS

Fan Actuator Stepwise – Position Driven

Summary

This object is used to control a fan in one or more speed steps depending on the continuous actuating values. This ObIS allows e.g. in combination with the other ObIS for HVAC to control a fan coil unit with one or two heat exchangers.

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Document updates

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1.0	2002.04.04	Editorially restyled, based on "04-02_ObIS_FAS_PD.doc"
1.0	2009.06.16	Editorial update in view of inclusion in the KNX Specifications v2.0.
01.00.01	2013.10.29	Editorial updates for the publication of KNX Specifications 2.1.

References

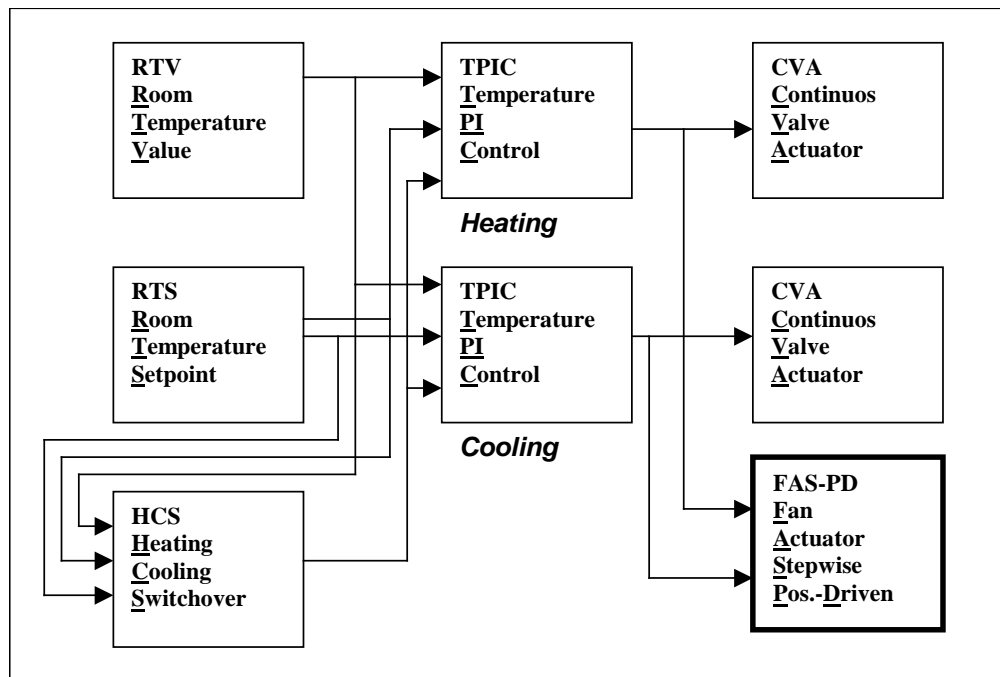None.

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**Figure 1 - Application of the ObIS „Fan Actuator Stepwise-Position Driven"
for Individual Room Temperature Control with a Fan Coil Unit**

2 ObIS Function Model(s)

2.1 ObIS Function Model "Fan Actuator Stepwise-Position Driven"

2.1.1 Aims and objectives

This object is used to control a fan in one or more speed steps depending on the continuous actuating values. This ObIS allows e.g. in combination with the other ObIS for HVAC (see Figure 1) to control a fan coil unit with one or two heat exchangers.

2.1.2 Functional specification

This ObIS controls the fan speed in one or more speed steps depending on the continuous actuating values. The fan speed steps may be the same as well for heating mode as for cooling mode (if no parameters for cooling mode are defined). The fan speed steps may be different for heating and for cooling mode if separate parameters are defined.

The actual fan speed step also depends on the optional inputs „Manual Override Enable" and „Manual Override Fan Speed" and on the input „Forced Fan Speed Step Enable" and the parameter „Forced Fan Speed Step". The priority of these inputs is defined in clause 2.1.5 "Priority of the Inputs" below. The FAS status information is an optional output.

2.1.3 Constraints

No constraints are defined for the ObIS Fan Actuator Stepwise – Position Driven.

2.1.4 Functional Block

Input(s)		Fan Actuator Stepwise Position Driven		Output(s)	
Continuous Actuating Value	5.001 --------	CAV	FSS	5.010 ---------	Fan Speed Step
Continuous Actuating Value Cooling	5.001 -------- See 3.3	CAVC	FASS	See 3.1 ---------	Fan Actuator Stepwise Status
Manual Override Enable	--------	MOE			
Manual Override Fan Speed	5.001 -------- See 3.3	MOFS			
Forced Fan Speed Step Enable	--------	FFSSE			
Parameter(s)					
Number of Fan Speed Steps	5.010 --------	NOFSS			
CAV for FSS 0 → 1	5.001 --------	CAVFSS01			
CAV for FSS 1 → 2	5.001 --------	CAVFSS12			
CAV for FSS (n-1) → n	5.001 --------	CAVFSSn1n			
CAV for FSS n → (n-1)	5.001 --------	CAVFSSnn1			
CAV for FSS 2 → 1	5.001 --------	CAVFSS21			
CAV for FSS 1 → 0	5.001 --------	CAVFSS10			
Cooling CAV for FSS 0 → 1	5.001 --------	CCAVFSS01			
Cooling CAV for FSS 1 → 2	5.001 --------	CCAVFSS12			
Cooling CAV for FSS (n-1) → n	5.001 --------	CCAVFSSn1n			
Cooling CAV for FSS n → (n-1)	5.001 --------	CCAVFSSnn1			
Cooling CAV for FSS 2 → 1	5.001 --------	CCAVFSS21			
Cooling CAV for FSS 1->0	5.001 --------	CCAVFSS10			
Forced Fan Speed Step	5.010 --------	FFSS			
Transmit Cycle Time Fan Speed Step	See 3.2 -------	TCTFSS			
Transmit FASS On Change Enable	See 3.3 --------	TFASSE			
Transmit Cycle Time FASS	See 3.2 -------	TCTFASS			

2.1.5 Priority of the Inputs

The Fan Speed Step is controlled by the Inputs "Manual Override Enable" and "Forced Fan Speed Step Enable". The priority of these inputs is shown in the table below:

Table 1 – Priority rules for the ObIS FAS-PD

Manual Override Enable MOE	Forced Fan Speed Step Enable FFSSE	Fan Speed Step
0	0	Fan Speed Step FSS
0	1	Forced Fan Speed Step FFSS
1	0	Manual Override Fan Speed MOFS
1	1	Manual Override Fan Speed MOFS

2.1.6 Properties

ID	Name	Abbr.	Description	Datapoint Type	M/O
1	**PID_OBJECT_TYPE**		Object Type	KNX_PropDataType	M

Input(s)

ID	Name	Abbr.	Description	Datapoint Type	M/O
<tbd>	**PID_VALUE_ACTUATING_-CONTINUOUS**	CAV	Continuous Actuating Value	5.001	M
<tbd>	**PID_VALUE_ACTUATING_-CONTINUOUS_COOLING**	CAVC	Continuous Actuating Value Cooling	5.001	O
<tbd>	**PID_OVERRIDE_MANUAL_ENABLE**	MOE	Manual Override Enable	See 3.3	O
<tbd>	**PID_OVERRIDE_MANUAL_SPEED_FAN**	MOFS	Manual Override Fan Speed	5.001	O
<tbd>	**PID_FAN_SPEED_STEP_FORCED_ENABLE**	FFSSE	Forced Fan Speed Step Enable	See 3.3	O

Output(s)

ID	Name	Abbr.	Description	Datapoint Type	M/O
<tbd>	**PID_SPEED_STEP_FAN**	FSS	Fan Speed Step	5.010	O
<tbd>	**PID_STATUS_FAN_ACTUATOR_-STEPWISE**	FASS	Fan Actuator Stepwise Status	See 3.1	O

Parameter(s)

ID	Name	Abbr.	Description	Datapoint Type	M/O
<tbd>	**PID_NUMBER_OF_FAN_SPEED_-STEPS**	NOFSS	Number of Fan Speed Steps	EIS 14	M
<tbd>	**PID_ACTUATING_VALUE_ CONTINUOUS_FSS_0_TO_1**	CAVFSS01	Continuous Actuating Value for FSS 0 to 1	5.001	M
<tbd>	**PID_ACTUATING_VALUE_ CONTINUOUS_FSS_1_TO_2**	CAVFSS12	Continuous Actuating Value for FSS 1 to 2	5.001	O
<tbd>	**PID_ACTUATING_VALUE_ CONTINUOUS_FSS_N-1_TO_N**	CAVFSSn1n	Continuous Actuating Value for FSS (n-1) to n	5.001	O
<tbd>	**PID_ACTUATING_VALUE_ CONTINUOUS_FSS_N_TO_N-1**	CAVFSSnn1	Continuous Actuating Value for FSS n to n-1	5.001	O
<tbd>	**PID_ACTUATING_VALUE_ CONTINUOUS_FSS_2_TO_1**	CAVFSS21	Continuous Actuating Value for FSS 2 to 1	5.001	O
<tbd>	**PID_ACTUATING_VALUE_ CONTINUOUS_FSS_1_TO_0**	CAVFSS10	Continuous Actuating Value for FSS 1 to 0	5.001	M
<tbd>	**PID_ACTUATING_VALUE_CONTIN UOUS_COOLING_FSS_0_TO_1**	CCAVFSS01	Continuous Actuating Value Cooling for FSS 0 to 1	5.001	O
<tbd>	**PID_ACTUATING_VALUE_CONTIN UOUS_COOLING_FSS_1_TO_2**	CCAVFSS12	Continuous Actuating Value Cooling for FSS 1 to 2	5.001	O
<tbd>	**PID_ACTUATING_VALUE_CONTIN UOUS_COOLING_FSS_N-1_TO_N**	CCAVFSSn1 n	Continuous Actuating Value Cooling for FSS (n-1) to n	5.001	O
<tbd>	**PID_ACTUATING_VALUE_CONTIN UOUS_COOLING_FSS_N_TO_N-1**	CCAVFSSnn 1	Continuous Actuating Value Cooling for FSS n to n-1	5.001	O
<tbd>	**PID_ACTUATING_VALUE_CONTIN UOUS_COOLING_FSS_2_TO_1**	CCAVFSS21	Continuous Actuating Value Cooling for FSS 2 to 1	5.001	O
<tbd>	**PID_ACTUATING_VALUE_CONTIN UOUS_COOLING_FSS_1_TO_0**	CCAVFSS10	Continuous Actuating Value Cooling for FSS 1 to 0	5.001	O
<tbd>	**PID_FAN_SPEED_STEP_FORCED**	FFSS	Forced Fan Speed Step	5.010	O
<tbd>	**PID_TRANSMIT_CYCLE_TIME_-SPEED_STEP_FAN**	TCTFSS	Transmit Cycle Time Fan Speed Step	See 3.2	O
<tbd>	**PID_ENABLE_TRANSMIT_FASS_ ON_CHANGE**	TFASSE	Transmit FASS on Change Enable	See 3.3	O
<tbd>	**PID_TRANSMIT_CYCLE_TIME_-FASS**	TCTFASS	Transmit Cycle Time FASS	See 3.2	O

2.1.6.1 Property PID_VALUE_ACTUATING_CONTINUOUS   CAV

Unit:	%
Range:	0..100
Default Value:	-
Communication Object/Parameter:	C
Input/Output:	I
R/W Rate	>> 10/day

Description: Fan Coil Units may be supplied by two pipes or three/four pipes.
Fan Coil Units with two pipes:
This is the positioning command used for calculating the fan speed steps based on the parameters CAVFSS01 .. CAVFSSn1n and CAVFSSnn1 .. CAVFSS10.
Fan Coil Units with three/four pipes:
This is the positioning command for the heating valve, used for calculating the fan speed steps based on the parameters CAVFSS01 .. CAVFSSn1n and CAVFSSnn1 .. CAVFSS10.

2.1.6.2 Property PID_VALUE_ACTUATING_CONTINUOUS_COOLING   CAVC

Unit:	%
Range:	0 ... 100
Default Value:	-
Communication Object/Parameter:	C
Input/Output:	I
R/W Rate	>> 10/day

Description: This is the positioning command for the cooling valve (see ObIS TPIC). It is used for calculating the fan speed steps either based on the parameters CAVFSS01 .. CAVFSSn1n and CAVFSSnn1 .. CAVFSS10 or (in case of different speeds for the cooling mode) based on the parameters CCAVFSS01 .. CCAVFSSn1n and CCAVFSSnn1 .. CCAVFSS10.
This communication object CAVC is only available in Fan Coil Units with three/four pipes.

2.1.6.3 Property PID_OVERRIDE_MANUAL_ENABLE   MOE

Unit	-
Range:	0,1
Default Value:	0
Communication Object/Parameter:	C
Input/Output:	I
R/W Rate	< 1/day

Description: This object serves to switch over the fan from automatic mode (0) to manual mode (1).
In manual mode the input object Manual Override Fan Speed MOFS is used for calculating the fan speed step.

2.1.6.4   Property PID_OVERRIDE_MANUAL_SPEED_FAN   MOFS

Unit	-
Range:	0 ... n
Default Value:	-
Communication Object/Parameter:	C
Input/Output:	I
R/W Rate	< 1/day
Description:	The input Manual Override Fan Speed MOFS is used for manual control of the Fan Speed Step FSS.

2.1.6.5   Property PID_FAN_SPEED_STEP_FORCED_ENABLE   FFSSE

Unit	-
Range:	0,1
Default Value:	0
Communication Object/Parameter:	C
Input/Output:	I
R/W Rate	< 1/day
Description:	This input Forced Fan Speed Step Enable FFSSE is used to switch the Fan Speed Step to the predefined speed step. This speed step is defined as parameter FFSS (see 2.1.6.21)

2.1.6.6   Property PID_SPEED_STEP_FAN   FSS

Unit:	-
Range:	0 ... n
Default Value:	-
Communication Object/Parameter:	C
Input/Output:	O
R/W Rate	>> 1/day
Description:	This is the actual fan speed step.

2.1.6.7   Property PID_STATUS_FAN_ACTUATOR_STEPWISE   FASS

Unit:	-
Range:	-
Default Value:	-
Communication Object/Parameter:	C
Input/Output:	O
R/W Rate	>> 10/day
Description:	This object contains several information about the fan actuator status (see 3.1).

2.1.6.8   Property PID_NUMBER_OF_FAN_SPEED_STEPS   NOFSS

Unit:	-
Range:	min: 1 .. 255
Default Value:	-
Communication Object/Parameter:	P
Input/Output:	R/W
R/W Rate	<< 1/day
Description:	This parameter defines the number of the fan speed steps.

2.1.6.9   Property PID_ACTUATING_VALUE_CONTINUOUS_FSS_0_TO_1

CAVFSS01

Unit:	%
Range:	min 0 ... 30
Default Value:	-
Communication Object/Parameter:	P
Input/Output:	R/W
R/W Rate	<< 1/day
Description:	This parameter defines the continuous actuating value up from which the fan speed is switched to step 1. This parameter is used for both heating and cooling if no separate parameters for cooling (CCAVFSS01 ... CCAVFSSn1n) are available or in case of a two pipes fan coil unit.

2.1.6.10 Property PID_ACTUATING_VALUE_CONTINUOUS_FSS_1_TO_2

CAVFSS12

Unit:	%
Range:	min 0 ... 60
Default Value:	-
Communication Object/Parameter:	P
Input/Output:	R/W
R/W Rate	<< 1/day
Description:	This parameter defines the continuous actuating value up from which the fan speed is switched to step 2. This parameter is used for both heating and cooling if no separate parameters for cooling (CCAVFSS01 ... CCAVFSSn1n) are available or in case of a two pipes fan coil unit.

2.1.6.11 Property PID_ACTUATING_VALUE_CONTINUOUS_FSS_N-1_TO_N

CAVFSSn1n

Unit:	%
Range:	min 0 ... 100
Default Value:	-
Communication Object/Parameter:	P
Input/Output:	R/W
R/W Rate	<< 1/day
Description:	This parameter defines the continuous actuating value up from which the fan speed is switched to step n. This parameter is used for both heating and cooling if no separate parameters for cooling (CCAVFSS01 ... CCAVFSSn1n) are available or in case of a two pipes fan coil unit.

2.1.6.12 Property PID_ACTUATING_VALUE_CONTINUOUS_FSS_N_TO_N-1

CAVFSSnn1

Unit:	%
Range:	min 0 ... 100
Default Value:	-
Communication Object/Parameter:	P
Input/Output:	R/W
R/W Rate	<< 1/day
Description:	This parameter defines the continuous actuating value up from which the fan speed is switched down from step n to step n-1. This parameter is used for both heating and cooling if no separate parameters for cooling (CCAVFSS01 ... CCAVFSSn1n) are available or in case of a two pipes fan coil unit.

2.1.6.13 Property PID_ACTUATING_VALUE_CONTINUOUS_FSS_2_TO_1

CAVFSS21

Unit:	%
Range:	min 0 ... 60
Default Value:	-
Communication Object/Parameter:	P
Input/Output:	R/W
R/W Rate	<< 1/day
Description:	This parameter defines the continuous actuating value up from which the fan speed is switched down from step 2 to step 1. This parameter is used for both heating and cooling if no separate parameters for cooling (CCAVFSS01 ... CCAVFSSn1n) are available or in case of a two pipes fan coil unit.

2.1.6.14 Property PID_ACTUATING_VALUE_CONTINUOUS_FSS_1_TO_0

CAVFSS10

Unit:	%
Range:	min 0 ... 30
Default Value:	-
Communication Object/Parameter:	P
Input/Output:	R/W
R/W Rate	<< 1/day
Description:	This parameter defines the continuous actuating value up from which the fan speed is switched down from step 1 to step 0 (off) . This parameter is used for both heating and cooling if no separate parameters for cooling (CCAVFSS01 ... CCAVFSSn1n) are available or in case of a two pipes fan coil unit.

2.1.6.15 Property PID_ACTUATING_VALUE_CONTINUOUS_COOLING_ FSS_0_TO_1
CCAVFSS01

Unit:	%
Range:	min 0 ... 30
Default Value:	-
Communication Object/Parameter:	P
Input/Output:	R/W
R/W Rate	<< 1/day
Description:	This parameter defines the continuous actuating value for cooling up from which the fan speed is switched to step 1. This parameter is only used in case of a three/ four pipes fan coil unit and if different steps for cooling are necessary.

2.1.6.16 Property PID_ACTUATING_VALUE_CONTINUOUS_COOLING_FSS_1_TO_2
CCAVFSS12

Unit:	%
Range:	min 0 ... 60
Default Value:	-
Communication Object/Parameter:	P
Input/Output:	R/W
R/W Rate	<< 1/day
Description:	This parameter defines the continuous actuating value for cooling up from which the fan speed is switched to step 2. This parameter is only used in case of a three/ four pipes fan coil unit and if different steps for cooling are necessary.

2.1.6.17 Property PID_ACTUATING_VALUE_CONTINUOUS_COOLING_FSS_N-1_TO_N
CCAVFSSn1n

Unit:	%
Range:	min 0 ... 100
Default Value:	-
Communication Object/Parameter:	P
Input/Output:	R/W
R/W Rate	<< 1/day
Description:	This parameter defines the continuous actuating value for cooling up from which the fan speed is switched to step n. This parameter is only used in case of a three/ four pipes fan coil unit and if different steps for cooling are necessary.

2.1.6.18 Property PID_ACTUATING_VALUE_CONTINUOUS_COOLING_FSS_N_TO_ N-1

CCAVFSSnn1

Unit:	%
Range:	min 0 ... 100
Default Value:	-
Communication Object/Parameter:	P
Input/Output:	R/W
R/W Rate	<< 1/day
Description:	This parameter defines the continuous actuating value up from which the fan speed is switched down from step n to step n-1. This parameter is only used in case of a three/four pipes fan coil unit and if different steps for cooling are necessary.

2.1.6.19 Property PID_ACTUATING_VALUE_CONTINUOUS_COOLING_FSS_2_TO_1

CCAVFSS21

Unit:	%
Range:	min 0 ... 60
Default Value:	-
Communication Object/Parameter:	P
Input/Output:	R/W
R/W Rate	<< 1/day
Description:	This parameter defines the continuous actuating value up from which the fan speed is switched down from step 2 to step 1. This parameter is only used in case of a three/four pipes fan coil unit and if different steps for cooling are necessary.

2.1.6.20 Property PID_ACTUATING_VALUE_CONTINUOUS_COOLING_FSS_1_TO_0

CCAVFSS10

Unit:	%
Range:	min 0 ... 30
Default Value:	-
Communication Object/Parameter:	P
Input/Output:	R/W
R/W Rate	<< 1/day
Description:	This parameter defines the continuous actuating value up from which the fan speed is switched down from step 1 to step 0 (off). This parameter is only used in case of a three/four pipes fan coil unit and if different steps for cooling are necessary.

2.1.6.21 Property PID_FAN_SPEED_STEP_FORCED   FFSS

Unit	-
Range:	0 ... n
Default Value:	-
Communication Object/Parameter:	P
Input/Output:	R/W
R/W Rate	<< 1/day
Description:	This parameter is used as Fan Speed Step FSS if the Forced Fan Speed Step Enable FFSSE object is set.

2.1.6.22 PID_TRANSMIT_CYCLE_TIME_SPEED_STEP_FAN   TCTFSS

Unit:	minutes
Range:	min 0, 15..60
Default Value:	0
Communication Object/Parameter:	P
Input/Output:	R/W
R/W Rate	<< 1/day
Description:	The Fan Speed Step FSS will be transmitted cyclically after the given cycle time. It will not be transmitted cyclically if the cycle time is set to "0".

2.1.6.23 PID_ENABLE_TRANSMIT_FASS_ON_CHANGE   TFASSE

Unit:	-
Range:	0,1
Default Value:	1
Communication Object/Parameter:	P
Input/Output:	R/W
R/W Rate	<< 1/day
Description:	This parameter defines whether the Fan Actuator Stepwise Status FASS will be transmitted on change (1) or not (0).

2.1.6.24 PID_TRANSMIT_CYCLE_TIME_FASS   TCTFASS

Unit:	minutes
Range:	min 0, 15..60
Default Value:	0
Communication Object/Parameter:	P
Input/Output:	R/W
R/W Rate	<< 1/day
Description:	The status object Fan Actuator Stepwise Status FASS will be transmitted cyclically after the given cycle time. It will not be transmitted cyclically if the cycle time is set to "0".

3 Datapoint Type(s)

3.1 Datapoint Type "Fan Actuator Status"

Format:	1 octet
	EEEE DCBA
Encoding:	See below
Range:	A..D= {0,1}
Unit:	-

Datapoint Types		
Code:	Symbol:	Encoding:
<tbd>	<tbd>	A : 0 = automatic; 1 = manual/forced [1] B : 0 = heating; 1 cooling C : 0 =CAV = 0 1 = CAV > 0 (0 = heating valve closed) D : 0 =CAVC = 0 1 = CAVHC > 0 (0 = cooling valve closed) E : reserved; shall be 0.

[1]   B = 1 if MOE or FFSSE = 1

3.2 Datapoint Type "8-bit unsigned integer with special function for zero"

Format:	1 octet
	VVVVVVVV
Encoding:	See below
Range:	V = [0…255] binary encoded
Unit:	See below

Datapoint Types				
Code:	Symbol:	Encoding:	Range:	Unit:
<tbd>	<tbd>	"time"	1…255 0 = corresponding function disabled	1 min

3.3   Datapoint Type "Boolean"

Format:	1 bit		
	V		
Encoding:	See below		
Range:	V = {0,1}		
Unit:	-		

Datapoint Types			
Code:	Symbol:	Encoding: V = 0	V = 1
1.003	MOE (Manual Override Enable)	disable	enable
1.003	HCM (Heating/ Cooling Mode)	cooling	heating
1.003	TFASSE (Transmit On Change Enable)	disable	enable
1.003	FFSSE (Forced Fan Speed Step Enable)	disable	enable