EAE MONA THERMOSTAT

Product Manual Mona Thermostat

Contents

Product Order Codes

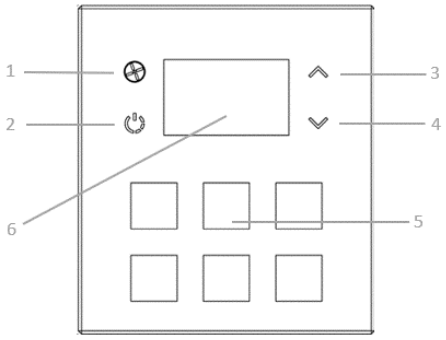
MN-B-T01	MONA 1 BUTTON THERMOSTAT BLACK
MN-W-T01	MONA 1 BUTTON THERMOSTAT WHITE
MN-B-T02	MONA 2 BUTTON THERMOSTAT BLACK
MN-W-T02	MONA 2 BUTTON THERMOSTAT WHITE
MN-B-T03	MONA 3 BUTTON THERMOSTAT BLACK
MN-W-T03	MONA 3 BUTTON THERMOSTAT WHITE
MN-B-T04	MONA 4 BUTTON THERMOSTAT BLACK
MN-W-T04	MONA 4 BUTTON THERMOSTAT WHITE
MN-B-T05	MONA 5 BUTTON THERMOSTAT BLACK
MN-W-T05	MONA 5 BUTTON THERMOSTAT WHITE
MN-B-T06	MONA 6 BUTTON THERMOSTAT BLACK
MN-W-T06	MONA 6 BUTTON THERMOSTAT WHITE

1. General

Mona KNX Thermostats offer a wide range of functional flexibility up to 6 programmable buttons beside its thermostat function. Mona Thermostat switches can be programmed for control lighting, shutter/blind drivers, speakers, make scene calls and mimic panic buttons. Each button can be programmed independently for a different function.

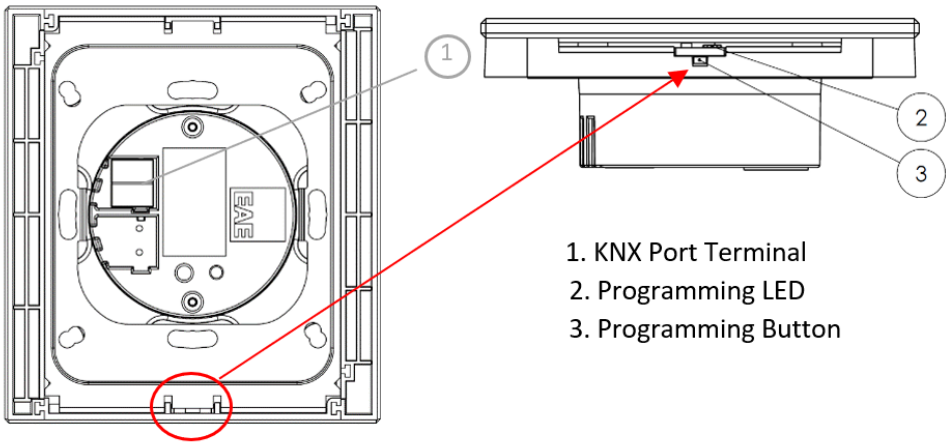
2. Device Technology

2.1. Button Definitions



1. Fan Speed (1, 2, 3, Auto)
2. Operation Mode Button (Comfort, Night, Away, Protection, OFF)
3. Setpoint Temperature UP
4. Setpoint Temperature DOWN
5. Programmable Buttons
6. Built-in Screen

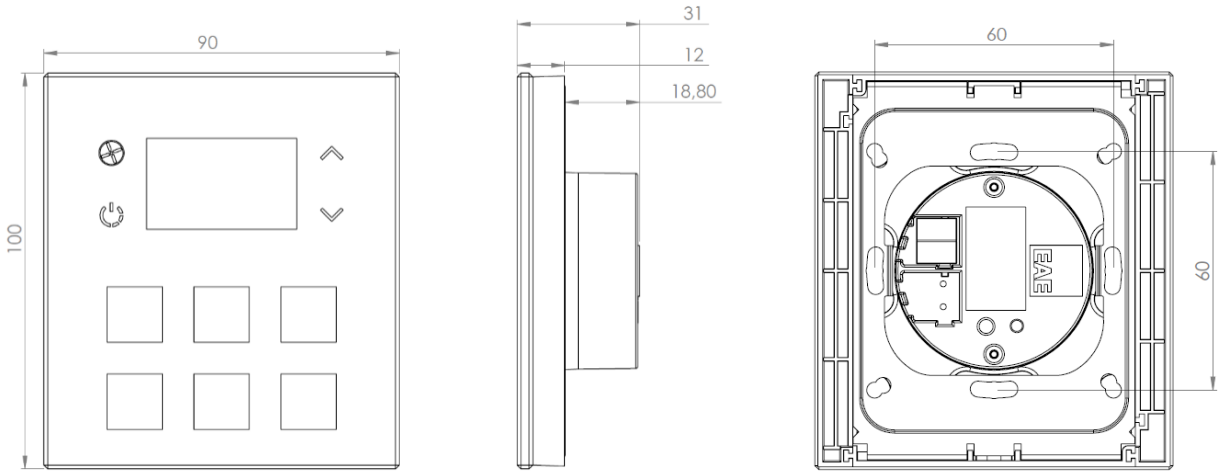
2.2. Connection Diagram



2.3. Technical Data

Protection Grade	IP 20	EN 60529
Safety Class	II	EN 61140
Operating Voltage	Voltage	21V… 30V DC, via the KNX bus
	Current drawn from bus	<10mA
Connections	KNX	Bus Connection
Measurement Accuracy	+/- 0.5 °C	
Operating Temperature	Ambient	-5 °C + 45 °C
	Storage	-25 °C + 55 °C
Humidity	Max. Air humidity condensation	95% no moisture
Dimensions	Front Side	90 x 100 mm
	Side- Surface mounted part	12 mm
	Side- Flush mounted part	18.8 mm
Weight	73 g	
Box Material	Glass, polycarbonate	
CE	In accordance with the EMC guideline and low voltage directive.	

2.4. Dimensions



3. Communication Object Table

No	Object Name	Function	Data Point Type	Flags
0	In operation	[0, 1]	1 bit DPT 1.017	CT
1, 7, 13, 19, 25, 31	Button 1…6	Telegr.switch	1 bit DPT 1.001	CT
	Button 1...6	Telegr.switch and Status	1 bit DPT 1.001	CWT
	Button 1...6	Telegr.shutter UP/DOWN	1 bit DPT 1.008	CWT
	Button 1...6 [Short Press 1]	Telegr.value[0, 1]	1 bit DPT 1.001	CT
		Telegr.value HVAC Control Mode	1 bit DPT 1.100	CT
		Telegr.value[0…255]	1 Byte DPT 5.010	CT
		Telegr.value[-127,128)	1 Byte DPT 6.010	CT
		Telegr.value HVAC Mode	1 Byte DPT 20.102	CT
		Telegr.value[0…100 %]	1 Byte DPT 5.001	CT
		Telegr.value(1…64 scene)	1 Byte DPT 18.001	CT
		Telegr.value[0…65535]	2 Byte DPT 7.001	CT
		Telegr.value[-32768…32767]	2 Byte DPT 8.001	CT
		Telegr.value(2-byte float)	2 Byte DPT 9.001	CT
		Telegr.value(4-byte unsigned)	4 Byte DPT 12.001	CT
		Telegr.value(4-byte signed)	4 Byte DPT 13.001	CT
		Telegr.value(4-byte float)	4 Byte DPT 14.005	CT
	Button 1…6 [Double Press 1]	Telegr.value[0, 1]	1 bit DPT 1.001	CT
		Telegr.value HVAC Control Mode	1 bit DPT 1.100	CT
		Telegr.value[0…255]	1 Byte DPT 5.010	CT
		Telegr.value[-127,128)	1 Byte DPT 6.010	CT
		Telegr.value HVAC Mode	1 Byte DPT 20.102	CT
		Telegr.value[0…100 %]	1 Byte DPT 5.001	CT
		Telegr.value(1…64 scene)	1 Byte DPT 18.001	CT
		Telegr.value[0…65535]	2 Byte DPT 7.001	CT
		Telegr.value[-32768…32767]	2 Byte DPT 8.001	CT
		Telegr.value(2-byte float)	2 Byte DPT 9.001	CT
		Telegr.value(4-byte unsigned)	4 Byte DPT 12.001	CT
		Telegr.value(4-byte signed)	4 Byte DPT 13.001	CT
		Telegr.value(4-byte float)	4 Byte DPT 14.005	CT
	Button 1…6 [Long Press 1]	Telegr.value[0, 1]	1 bit DPT 1.001	CT
		Telegr.value HVAC Control Mode	1 bit DPT 1.100	CT
		Telegr.value[0…255]	1 Byte DPT 5.010	CT
		Telegr.value[-127,128)	1 Byte DPT 6.010	CT
		Telegr.value HVAC Mode	1 Byte DPT 20.102	CT
		Telegr.value[0…100 %]	1 Byte DPT 5.001	CT
		Telegr.value(1…64 scene)	1 Byte DPT 18.001	CT
		Telegr.value[0…65535]	2 Byte DPT 7.001	CT
		Telegr.value[-32768…32767]	2 Byte DPT 8.001	CT
		Telegr.value(2-byte float)	2 Byte DPT 9.001	CT
		Telegr.value(4-byte unsigned)	4 Byte DPT 12.001	CT
		Telegr.value(4-byte signed)	4 Byte DPT 13.001	CT
		Telegr.value(4-byte float)	4 Byte DPT 14.005	CT

No	Object Name	Function	Data Point Type	Flags
2, 8, 14, 20, 26, 32	Button 1...6	Telegr.dimming	4 bit DPT 3.007	CT
	Button 1...6	Telegr.STOP	1 bit DPT 1.017	CWT
	Button 1...6	Telegr.STOP / Lamella Adj.	1 bit DPT 1.007	CWT
	Button 1…6 [Short Press 2]	Telegr.value[0, 1]	1 bit DPT 1.001	CT
		Telegr.value HVAC Control Mode	1 bit DPT 1.100	CT
		Telegr.value[0…255]	1 Byte DPT 5.010	CT
		Telegr.value[-127,128)	1 Byte DPT 6.010	CT
		Telegr.value HVAC Mode	1 Byte DPT 20.102	CT
		Telegr.value[0…100 %]	1 Byte DPT 5.001	CT
		Telegr.value(1…64 scene)	1 Byte DPT 18.001	CT
		Telegr.value[0…65535]	2 Byte DPT 7.001	CT
		Telegr.value[-32768…32767]	2 Byte DPT 8.001	CT
		Telegr.value(2-byte float)	2 Byte DPT 9.001	CT
		Telegr.value(4-byte unsigned)	4 Byte DPT 12.001	CT
		Telegr.value(4-byte signed)	4 Byte DPT 13.001	CT
		Telegr.value(4-byte float)	4 Byte DPT 14.005	CT
	Button 1…6 [Double Press 2]	Telegr.value[0, 1]	1 bit DPT 1.001	CT
		Telegr.value HVAC Control Mode	1 bit DPT 1.100	CT
		Telegr.value[0…255]	1 Byte DPT 5.010	CT
		Telegr.value[-127,128)	1 Byte DPT 6.010	CT
		Telegr.value HVAC Mode	1 Byte DPT 20.102	CT
		Telegr.value[0…100 %]	1 Byte DPT 5.001	CT
		Telegr.value(1…64 scene)	1 Byte DPT 18.001	CT
		Telegr.value[0…65535]	2 Byte DPT 7.001	CT
		Telegr.value[-32768…32767]	2 Byte DPT 8.001	CT
		Telegr.value(2-byte float)	2 Byte DPT 9.001	CT
		Telegr.value(4-byte unsigned)	4 Byte DPT 12.001	CT
		Telegr.value(4-byte signed)	4 Byte DPT 13.001	CT
		Telegr.value(4-byte float)	4 Byte DPT 14.005	CT
	Button 1…6 [Long Press 2]	Telegr.value[0, 1]	1 bit DPT 1.001	CT
		Telegr.value HVAC Control Mode	1 bit DPT 1.100	CT
		Telegr.value[0…255]	1 Byte DPT 5.010	CT
		Telegr.value[-127,128)	1 Byte DPT 6.010	CT
		Telegr.value HVAC Mode	1 Byte DPT 20.102	CT
		Telegr.value[0…100 %]	1 Byte DPT 5.001	CT
		Telegr.value(1…64 scene)	1 Byte DPT 18.001	CT
		Telegr.value[0…65535]	2 Byte DPT 7.001	CT
		Telegr.value[-32768…32767]	2 Byte DPT 8.001	CT
		Telegr.value(2-byte float)	2 Byte DPT 9.001	CT
		Telegr.value(4-byte unsigned)	4 Byte DPT 12.001	CT
		Telegr.value(4-byte signed)	4 Byte DPT 13.001	CT
		Telegr.value(4-byte float)	4 Byte DPT 14.005	CT

No	Object Name	Function	Data Point Type	Flags
3, 9, 15, 21, 27, 33	Button 1...6	Switch Status	1 Bit DPT 1.001	CW
	Button 1...6	Top Position	1 bit DPT 1.002	CW
	Button 1…6 [Short Press 3]	Telegr.value[0, 1]	1 bit DPT 1.001	CT
		Telegr.value HVAC Control Mode	1 bit DPT 1.100	CT
		Telegr.value[0…255]	1 Byte DPT 5.010	CT
		Telegr.value[-127,128)	1 Byte DPT 6.010	CT
		Telegr.value HVAC Mode	1 Byte DPT 20.102	CT
		Telegr.value[0…100 %]	1 Byte DPT 5.001	CT
		Telegr.value(1…64 scene)	1 Byte DPT 18.001	CT
		Telegr.value[0…65535]	2 Byte DPT 7.001	CT
		Telegr.value[-32768…32767]	2 Byte DPT 8.001	CT
		Telegr.value(2-byte float)	2 Byte DPT 9.001	CT
		Telegr.value(4-byte unsigned)	4 Byte DPT 12.001	CT
		Telegr.value(4-byte signed)	4 Byte DPT 13.001	CT
		Telegr.value(4-byte float)	4 Byte DPT 14.005	CT
	Button 1…6 [Double Press 3]	Telegr.value[0, 1]	1 bit DPT 1.001	CT
		Telegr.value HVAC Control Mode	1 bit DPT 1.100	CT
		Telegr.value[0…255]	1 Byte DPT 5.010	CT
		Telegr.value[-127,128)	1 Byte DPT 6.010	CT
		Telegr.value HVAC Mode	1 Byte DPT 20.102	CT
		Telegr.value[0…100 %]	1 Byte DPT 5.001	CT
		Telegr.value(1…64 scene)	1 Byte DPT 18.001	CT
		Telegr.value[0…65535]	2 Byte DPT 7.001	CT
		Telegr.value[-32768…32767]	2 Byte DPT 8.001	CT
		Telegr.value(2-byte float)	2 Byte DPT 9.001	CT
		Telegr.value(4-byte unsigned)	4 Byte DPT 12.001	CT
		Telegr.value(4-byte signed)	4 Byte DPT 13.001	CT
		Telegr.value(4-byte float)	4 Byte DPT 14.005	CT
	Button 1…6 [Long Press 3]	Telegr.value[0, 1]	1 bit DPT 1.001	CT
		Telegr.value HVAC Control Mode	1 bit DPT 1.100	CT
		Telegr.value[0…255]	1 Byte DPT 5.010	CT
		Telegr.value[-127,128)	1 Byte DPT 6.010	CT
		Telegr.value HVAC Mode	1 Byte DPT 20.102	CT
		Telegr.value[0…100 %]	1 Byte DPT 5.001	CT
		Telegr.value(1…64 scene)	1 Byte DPT 18.001	CT
		Telegr.value[0…65535]	2 Byte DPT 7.001	CT
		Telegr.value[-32768…32767]	2 Byte DPT 8.001	CT
		Telegr.value(2-byte float)	2 Byte DPT 9.001	CT
		Telegr.value(4-byte unsigned)	4 Byte DPT 12.001	CT
		Telegr.value(4-byte signed)	4 Byte DPT 13.001	CT
		Telegr.value(4-byte float)	4 Byte DPT 14.005	CT

No	Object Name	Function	Data Point Type	Flags
4, 10, 16, 22, 28, 34	Button 1…6	Bottom Position	1 bit DPT 1.002	CW
	Button 1…6 [Short Press 4]	Telegr.value[0, 1]	1 bit DPT 1.001	CT
		Telegr.value HVAC Control Mode	1 bit DPT 1.100	CT
		Telegr.value[0…255]	1 Byte DPT 5.010	CT
		Telegr.value[-127,128)	1 Byte DPT 6.010	CT
		Telegr.value HVAC Mode	1 Byte DPT 20.102	CT
		Telegr.value[0…100 %]	1 Byte DPT 5.001	CT
		Telegr.value(1…64 scene)	1 Byte DPT 18.001	CT
		Telegr.value[0…65535]	2 Byte DPT 7.001	CT
		Telegr.value[-32768…32767]	2 Byte DPT 8.001	CT
		Telegr.value(2-byte float)	2 Byte DPT 9.001	CT
		Telegr.value(4-byte unsigned)	4 Byte DPT 12.001	CT
		Telegr.value(4-byte signed)	4 Byte DPT 13.001	CT
		Telegr.value(4-byte float)	4 Byte DPT 14.005	CT
	Button 1…6 [Double Press 4]	Telegr.value[0, 1]	1 bit DPT 1.001	CT
		Telegr.value HVAC Control Mode	1 bit DPT 1.100	CT
		Telegr.value[0…255]	1 Byte DPT 5.010	CT
		Telegr.value[-127,128)	1 Byte DPT 6.010	CT
		Telegr.value HVAC Mode	1 Byte DPT 20.102	CT
		Telegr.value[0…100 %]	1 Byte DPT 5.001	CT
		Telegr.value(1…64 scene)	1 Byte DPT 18.001	CT
		Telegr.value[0…65535]	2 Byte DPT 7.001	CT
		Telegr.value[-32768…32767]	2 Byte DPT 8.001	CT
		Telegr.value(2-byte float)	2 Byte DPT 9.001	CT
		Telegr.value(4-byte unsigned)	4 Byte DPT 12.001	CT
		Telegr.value(4-byte signed)	4 Byte DPT 13.001	CT
		Telegr.value(4-byte float)	4 Byte DPT 14.005	CT
	Button 1…6 [Long Press 4]	Telegr.value[0, 1]	1 bit DPT 1.001	CT
		Telegr.value HVAC Control Mode	1 bit DPT 1.100	CT
		Telegr.value[0…255]	1 Byte DPT 5.010	CT
		Telegr.value[-127,128)	1 Byte DPT 6.010	CT
		Telegr.value HVAC Mode	1 Byte DPT 20.102	CT
		Telegr.value[0…100 %]	1 Byte DPT 5.001	CT
		Telegr.value(1…64 scene)	1 Byte DPT 18.001	CT
		Telegr.value[0…65535]	2 Byte DPT 7.001	CT
		Telegr.value[-32768…32767]	2 Byte DPT 8.001	CT
		Telegr.value(2-byte float)	2 Byte DPT 9.001	CT
		Telegr.value(4-byte unsigned)	4 Byte DPT 12.001	CT
		Telegr.value(4-byte signed)	4 Byte DPT 13.001	CT
		Telegr.value(4-byte float)	4 Byte DPT 14.005	CT

No	Object Name	Function	Data Point Type	Flags
5, 11, 17, 23, 29, 35	Button 1…6 [LED Status]	[0, 1]	1 bit DPT 1.001	CW
6, 12, 18, 24, 30, 36	Button 1…6 Lock	0=Unlock; 1=Lock	1 bit DPT 1.001	CW
74	Day/Night	0=Day; 1=Night	1 bit DPT 1.001	CW
		0=Night; 1=Day	1 bit DPT 1.006	
75	Proximity	0=Absence; 1=Presence	1 bit DPT 1.011	CW
		BIT6: 0=Presence; 1=Absence	1 Byte DPT 26.001	CW
		BIT6: 0=Presence; 1=Absence	1 Byte DPT 26.001	CWT
76	Thermostat Joint Link	Link the same group address for all thermostats	5 Byte NON-DPT	CWT
77	Regulation	0=Off; 1=On	1 bit DPT 1.001	CW
78	Regulation (Status)	0=Off; 1=On	1 bit DPT 1.001	CRT
79	Window Status	0=Closed; 1=Open	1 bit DPT 1.019	CW
		0=Open; 1=Closed	1 bit DPT 1.006	
81	Switchover	0=Cooling; 1=Heating	1 bit DPT 1.100	CR(W)T
		1=Heat; 3=Cool	1 Byte DPT 20.105	CR(W)T
82	Control Mode Status	0=Cooling; 1=Heating	1 bit DPT 1.100	CR(W)T
		1=Heat; 3=Cool	1 Byte DPT 20.105	CR(W)T
83	Heat Control Value	[0,1]	1 bit DPT 1.001	CT
		[%] [0…255]	1 Byte DPT 5.001	CT
	Heat/Cool Control Value	[0,1]	1 bit DPT 1.001	CT
		[%] [0…255]	1 Byte DPT 5.001	CT
84	Cool Control Value	[0,1]	1 bit DPT 1.001	CT
		[%] [0…255]	1 Byte DPT 5.001	CT
85	Additional Heat Control Value	[0,1]	1 bit DPT 1.001	CT
		[%] [0…255]	1 Byte DPT 5.001	CT
	Additional Heat/Cool Control Value	[0,1]	1 bit DPT 1.001	CT
		[%] [0…255]	1 Byte DPT 5.001	CT
86	Additional Cool Control Value	[0,1]	1 bit DPT 1.001	CT
		[%] [0…255]	1 Byte DPT 5.001	CT
87	Split Heat Error	0=No Error; 1=Error	1 bit DPT 1.005	CW
	Split Heat/Cool Error			
88	Split Cool Error			
89	Comfort Mode	[0, 1]	1 bit DPT 1.003	CW
	Operating Mode	1=Comfort; 2=Away(Standby); 3=Night(Economy); 4=Protection	1 Byte DPT 20.102	CW

No	Object Name	Function	Data Point Type	Flags
90	Night Mode	[0, 1]	1 bit DPT 1.003	CW
91	Away Mode	[0, 1]	1 bit DPT 1.003	CW
92	Protection Mode	[0, 1]	1 bit DPT 1.003	CW
93	Comfort Mode (Status)	[0, 1]	1 bit DPT 1.002	CRT
	Operating Mode (Status)	1=Comfort; 2=Away(Standby); 3=Night(Economy); 4=Protection	1 Byte DPT 20.102	CRT
94	Night Mode (Status)	[0, 1]	1 bit DPT 1.002	CRT
95	Away Mode (Status)	[0, 1]	1 bit DPT 1.002	CRT
96	Protection Mode (Status)	[0, 1]	1 bit DPT 1.002	CRT
97	Current Temperature	°C	2 Byte DPT 9.001	CRT
		°F	2 Byte DPT 9.027	CRT
98	External Temperature Sensor	°C	2 Byte DPT 9.001	CRT
		°F	2 Byte DPT 9.027	CRT
99	Spot Temperature Sensor	°C	2 Byte DPT 9.001	CRT
		°F	2 Byte DPT 9.027	CRT
100	Current Setpoint	°C	2 Byte DPT 9.001	CRT
		°F	2 Byte DPT 9.027	CRT
101	Change Setpoint	°C	2 Byte DPT 9.001	CRT
		°F	2 Byte DPT 9.027	CRT
102	Change Setpoint [+/-]	0= –0 .1°C; 1= +0.1°C	1 bit DPT 1.007	CW
		0= –0 .5°C; 1= +0.5°C	1 bit DPT 1.007	CW
		0= –1°C; 1= +1°C	1 bit DPT 1.007	CW
		0= –0 .1°F; 1= +0.1°F	1 bit DPT 1.007	CW
		0= –0 .5°F; 1= +0.5°F	1 bit DPT 1.007	CW
		0= –1°F; 1= +1°F	1 bit DPT 1.007	CW
115	Fan Speed 0	[0, 1]	1 bit DPT 1.002	CT
116	Automatic Fan Speed	0= Disable; 1=Enable	1 bit DPT 1.003	CWT
		0= Enable; 1=Disable	1 bit DPT 1.006	CWT
117	Fan Speed 1	[0, 1]	1 bit DPT 1.002	CWT
118	Fan Speed 2	[0, 1]	1 bit DPT 1.002	CWT
119	Fan Speed 3	[0, 1]	1 bit DPT 1.002	CWT
120	Fan Speed	0=Spd0 (T); 1...3=Spd1...3(WT)	1 Byte DPT 5.010	CWT
		0=Auto; 1...3=Spd1...3		CWT
121	Fan Speed [%]	0%=Spd0 (T); [0,4...100]%=Spd1...3 (WT)	1 Byte DPT 5.001	CWT
		0%=Auto; [0,4...100]%=Spd1...3		CWT
122	LCD Fan Speed Status	0=Spd0; 1...3=Spd1...3	1 Byte DPT 5.010	CW
		0%=Spd0; [0,4...100]%=Spd1...3		CW
123	LCD Temperature Unit	0=Celsius; 1=Fahrenheit	1 bit DPT 1.001	CRWT
124... 139	IN1, IN2/OUT15, IN3/OUT14, ... IN15/OUT2, OUT1 (Logic Block 1)	Input	1 bit DPT 1.002	CRW
		Output	1 Byte DPT 5.010	CRT
140... 155	IN1, IN2/OUT15, IN3/OUT14, ... IN15/OUT2, OUT1 (Logic Block 2)	Input	1 bit DPT 1.002	CRW
		Output	1 Byte DPT 5.010	CRT

4. Parameters and Communication Objects

4.1. General

General parameters include In Operation (Device Alive) Function, Telegram Limit Function, Telegram Transmission Delay, Built-in Sensors, Logic Blocks, Diagnostics.

4.1.1. Parameters

Parameter	Settings	Description
GENERAL		
In Operation Telegram	checked/**unchecked**	In operation can be used to ensure that device is alive and connected to KNX line.
In Operation Value	0/**1**	Visible when "In Operation Telegram" checked. Selected value will be sent as device alive operation.
In Operation Sending Interval	10…**300**…65535 s	Visible when "In Operation Telegram" checked. Cyclic time period for sending in operation value.
Telegram Limiter	checked/**unchecked**	Limits the number of telegrams to send in certain time period.
Telegram Limit Period Duration	**50ms**, 100ms, …, 30s, 1min	Visible when "Telegram Limiter" checked. Determine the period for sending telegram.
Maximum Telegram Count in Period	**1**…255	Visible when "Telegram Limiter" checked. Maximum number of telegrams to send in telegram limit period duration.
Telegram Transmission Delay	**1**…255	This parameter is used to set delay for sending the first telegram when device powered on.
SWITCH		
Switch Configuration	**1 Button** 2 Button (Left – Right) 2 Button (Up – Down) 3 Button 4 Button 5 Button 6 Button (3 Left – 3 Right) 6 Button (3 Up – 3 Down) 7 Button 8 Button 9 Button 10 Button 11 Button 12 Button	Button count of device.
Status LED "Operation Indication" Duration	0.3, **0.75**, 1.5, 2.25, 3 s	This parameter is used to select the LEDs ON duration when status LEDs used as operation indication with buttons.

Parameter	Settings	Description
THERMOSTAT		
Window Status	checked / **unchecked**	This parameter is used to enable KNX window sensor input in order to avoid energy loss.
DPT Window Object	**0 = Closed; 1 = Open** 0 = Open; 1 = Closed	This parameter is used to determine the object type for window sensor input.
Delay for Open Action	**0**…65535 s	This parameter is used to determine the delay for window open action. Window sensor should be active for delay time to switch protection mode. If "0": Window sensor state changes will be applied immediately.
Joint Operation	checked/**unchecked**	This parameter is used to activate the multi thermostat controlling. All EAE thermostats can be synchronized via one group object named as Thermostat Joint Link.
Built-in LCD Display	**checked** / unchecked	This parameter must be "checked" if LCD screen is existing on device.
LCD		
Setpoint Segment	**Enable** / Disable	It allows to show current setpoint on LCD display. When disabled, the current setpoint digits will be hidden. If any setpoint change is occurred, the setpoint information will be shown and blinked for a few seconds on "current temperature" digits instead of current temperature information.
Temperature Segment in Protection Mode	**Enable** / Disable	It allows to show current temperature on LCD display when Protection Mode is active.
Temperature Segment during Regulation Off	**Enable** / Disable	It allows to show current temperature on LCD display when Regulation is off.
Icon Blinking on Protection Activation	**Enable** / Disable	It allows to blink warning icon in Protection mode.
BUILT-IN SENSORS		
Ambient Light Sensor	checked/**unchecked**	This parameter can be selected if the relevant sensors are exist in device.
Proximity Sensor	checked/**unchecked**	
LOGIC BLOCKS		
Logic Blocks	**None**, 1, 2	Logic Blocks Menu will be shown.
DIAGNOSTICS		
Firmware Version	**Read Firmware Version**	Device Firmware version will be shown.
Uptime	**Read Uptime**	Device up time since the device energized.
Ambient Light Sensor	**Check Built-in Sensors**	If the sensor exist, answer will be YES
Proximity Sensor		If the sensor exist, answer will be YES

4.1.2. Communication Objects

No	Object Name	Function	Data Point Type	Flags
0	General – In operation	Active	1 bit DPT 1.002	CT
In operation value (0,1) selected through “In operation bit” parameter will be sent via the group address which is linked to this communication object				
76	Thermostat Joint Link	Link with the same group address for all thermostats	5 bytes – Custom	CWT
All EAE Thermostats can be syncronized via object.				
79	Window Status	0=Closed; 1=Open 0=Open; 1=Closed	1 bit DPT 1.019 1 bit DPT 1.006	CW
This parameter enables communication object which will be used to detect window status. When window detected as open, the thermostat will switch to “Protection Mode”. An error icon will be appeared on LCD screen during “Window Open State”. When the window detected as close, the previous operating mode will be switched and the error icon will be disappeared.				
124…139	IN1, IN2/OUT15, IN3/OUT14, … IN15/OUT2, OUT1 (Logic Block 1)	Active	DPT 1.002 DPT 5.010	CRW (Input) CRT (Output)
140…155	IN1, IN2/OUT15, IN3/OUT14, … IN15/OUT2, OUT1 (Logic Block 2)	Active	DPT 1.002 DPT 5.010	CRW (Input) CRT (Output)
These objects are able to control logic processes.				

4.2. LED Brightness

This function is used to dim the buttons according to Bright (ON) and Dark (OFF) dim levels. Additionally, the buttons can be dimmed with another methods such as Ambient Light or Proximity dim.

4.2.1. Parameters

Parameter	Setting	Description
SWITCH STATUS & THERMOSTAT BUTTON LEDS		
Bright Level	0 = OFF, 1, 2, 3, 4, 5, 6, **7**	The bright dim level can be set.
Dark Level	0 = OFF, **1**, 2, 3, 4, 5, 6, 7	The dark dim level can be set.
THERMOSTAT LCD BACKLIGHT		
Bright Level	0 = OFF, 1, 2, 3, 4, 5, 6, **7**	The bright dim level can be set.
Dark Level	0 = OFF, **1**, 2, 3, 4, 5, 6, 7	The dark dim level can be set.
AUTO-DIM (Bright -> Dark)		
SWITCH STATUS LEDS		
Ambient Light Dim	**unchecked** / checked / *Detection Disabled	Auto dim switch status leds to darker according to Day/Night state.
Proximity Dim	**unchecked** / checked / *Detection Disabled	Auto dim switch status leds to darker according to touch to the buttons.
THERMOSTAT BUTTON LEDS		
Ambient Light Dim	**unchecked** / checked / *Detection Disabled	Auto dim thermostat button leds to darker according to Day/Night state.
Proximity Dim	**unchecked** / checked / *Detection Disabled	Auto dim thermostat button leds to darker according to touch to the buttons.
THERMOSTAT LCD BACKLIGHT		
Ambient Light Dim	**unchecked** / checked / *Detection Disabled	Auto dim thermostat LCD backlight to darker according to Day/Night state.
Proximity Dim	**unchecked** / checked / *Detection Disabled	Auto dim thermostat LCD backlight to darker according to touch to the buttons.
*: If the Proximity or Ambient Light function is not selected in Sensors page, that message will be appeared.		

4.2.2. Communication Objects

No	Object Name	Function	Data Point Type	Flags
74	Day/Night	0=Day; 1=Night	1 bit DPT 1.001	CW
		0=Night; 1=Day	1 bit DPT 1.006	
Day or Night mode can be selected via object.				

4.3. Thermocolor

Parameter	Setting	Description
THERMOCOLOR (A Dynamic LED Color)		
Thermocolor changes with	**Control Mode** Temperature	This parameter is used to select the type of color changes for thermocolor option.
If Control Mode Selected;		
Heating	**Red**, Yellow, Green, Cyan, Blue, Magenta, White, None	This parameter is used to select the color when thermostat in Heating mode.
Cooling	Red, Yellow, Green, Cyan, **Blue**, Magenta, White, None	This parameter is used to select the color when thermostat in Cooling mode.
Change when in Protection Mode	unchecked / **checked**	This parameter is used to activate color when thermostat in Protection mode.
Protection Mode	Red, Yellow, Green, Cyan, Blue, Magenta, **White**, None	This parameter is used to select color when thermostat in Protection mode.
Heating/Cooling Colors when Protection is Active	unchecked / **checked**	This parameter is used to select color for Protection Mode according to Heating/Cooling State colors instead of Protection Mode color.
Change when Regulation is Off	unchecked / **checked**	This parameter is used to activate color when thermostat regulation is OFF.
Regulation Off	Red, Yellow, Green, Cyan, Blue, Magenta, White, **None**	This parameter is used to select color when thermostat regulation is OFF.
If Temperature Selected;		
Hot (above setpoint)	**Red**, Yellow, Green, Cyan, Blue, Magenta, White, None	This parameter is used to select color when the room temperature is higher that setpoint for "Zone (+/-)" value or higher.
Target (near setpoint)	Red, Yellow, Green, Cyan, Blue, Magenta, **White**, None	This parameter is used to select color when the room temperature is equal to setpoint.
Zone (+/-)	1…**2**…255 x 0.1K	This parameter is used to define the differences between room temperature and setpoint.
Cold (below setpoint)	Red, Yellow, Green, Cyan, **Blue**, Magenta, White, None	This parameter is used to select color when the room temperature is lower that setpoint for "Zone (+/-)" value or higher.
When in Protection Mode	Red, Yellow, Green, Cyan, Blue, Magenta, **White**, None	This parameter is used to select color when thermostat in Protection mode.
Hot/Cold Colors when Protection is Active	unchecked / **checked**	This parameter is used to select color for Protection Mode according to Hot/Cold State colors instead of Protection Mode color.
When Regulation is Off	Red, Yellow, Green, Cyan, Blue, Magenta, White, **None**	This parameter is used to select color when thermostat regulation is OFF.

4.3. Sensors

These parameters are used to select Ambient Light dimming or Proximity dim.

4.3.1. Ambient Light - Parameters

Parameter	Setting	Description
AMBIENT LIGHT (Day/Night)		
Ambient Light Detection	**unchecked** / checked	This parameter activates auto-dim according to Day and Night states.
Day/Night Source	Object (External)	Day/Night states are changing via a group object.
DPT Day/Night Object	**0 = Day; 1 = Night** 0 = Night; 1 = Day	This parameter determines the object value for Day and Night.
Day/Night State after KNX Bus Recovery		This parameter is used select the Ambient Light state after KNX bus recovery.

4.3.1.1. Ambient Light Communication Objects

No	Object Name	Function	Data Point Type	Flags
74	Day/Night	0=Day; 1=Night	1 bit DPT 1.001	CW
		0=Night; 1=Day	1 bit DPT 1.006	
Day or Night mode can be selected via object.				

4.3.2. Proximity - Parameters

Parameter	Setting	Description
PROXIMITY (Presence/Absence)		
Proximity Detection	**unchecked** / checked	This parameter activates auto-dim according to proximity state.
Proximity Source	**Button Press**, Object, Button Press and Object	This parameter is used select the proximity type.
Presence Timeout	1…**10**…255 s	This parameter defines the timeout for Presence. When it is reached, the device will be in Absent mode and dimming will be applied.
Send Proximity Status	**unchecked** / checked	This parameter is used to send Proximity status via group object.
Proximity Object	**Single Generator**, Multi Generator	This parameter is used to select the sending/receiving type of proximity
Presence Transmit Repeat Interval	**0**…255 s	This parameter is used to determine the repeat interval for proximity status.
Proximity Generator ID	**1**, 2, 3	This parameter is used for Multi Generator. Sends 1-byte object.
Object Monitoring Timeout	**0**…255	This parameter is used to determine the timeout for proximity object receiving. Device will be in Absence mode end of the time, if there is no presence.

4.4. Switch

Select the desired operation from the “Button N” (N: Button number) parameter in General Tab in ETS Configuration.

Push buttons have functions as switch, switch and dim, shutter and value operation.

Push buttons are numbered and can be shown in General Tab. Every function enables different parameters and communication objects that will be explained in the following chapters.

Parameter	Setting	Description
Push Button Function	**No Function**	Disables the push button
	Switch	Push buttons can be used to send on/off telegrams. (For more information Chapter 4.4.1)
	Switch and Dim	Push buttons can send on/off and dimming telegrams. (For more information Chapter 4.4.2)
	Shutter	Push button can control shutter, venetian blind, blind, roller and awning. (For more information Chapter 4.4.3)
	Value Operation	Push button can send predefined values from different Data Point Types. (Refer Section 4.4.4)

Push buttons also have status LEDs which can be configured to indicate state of the operation that is configured.

Parameter	Setting	Description
COMMON		
Name		You can assing a name to show in ETS Parameter Tabs.
LED STATUS ON		
Brightness	**Bright** / Dark / OFF	LED Feedback brightness level when button is at ON state.
Color	White, Red, Green, **Blue**, Yellow, Magenta, Cyan, OFF	LED Feedback color when button is at ON state.
LED STATUS OFF		
Brightness	Bright / Dark / **OFF**	LED Feedback brightness level when button is at OFF state.
Color	White, **Red**, Green, Blue, Yellow, Magenta, Cyan, OFF	LED Feedback color when button is at OFF state.
BUTTON LOCK		
Button Lock Object DPT	**0 = Unlock; 1 = Lock** 0 = Lock; 1 = Unlock	Selects object type for lock object.
LED Function when Locked	**Active** / Disable	Enable or disable LED feedback from the button.
Lock State after KNX Bus Recovery	Reset / **Keep**	Button lock state after Bus failure.

4.4.1. Switch

Selecting “Switch” as “Push Button Function“ enables to send 1 bit On(1)/Off(0) telegrams to the group address that is linked to respective communication object. Touching and releasing buttons can be assigned to different commands (On, Off, Toggle and No Command). Status LEDs can be configured to notify the current status of operation directly with buttons or using communication objects for confirmation to show current status.

4.4.1.1.Parameters

Parameter	Setting	Description
COMMON		
Command on Press	On / Off / **Toggle** / No command	Selects button function when button touched.
Command on Release	On / Off / Toggle / **No command**	Selects button function when button released.
Separate Switch Status Object	checked / **unchecked**	This parameter defines the additional obtect to write switch status.
Function of LED	LED Status ON LED Status OFF Operation Indication **Status Indication** Inverted Status Indication	This parameter is used to select status LED function of button.

4.4.1.2.Communication Objects

No	Object Name	Function	Data Point Type	Flags
1	Button 1…12	Telegr.switch	1 bit DPT 1.001	C(W)T
On/Off telegrams will be sent to group address that is linked to this communication object.				
2	Button 1…12	Switch Status	1 bit DPT 1.002	CW
Confirmation for On/Off switch telegrams will be received from this communication object. If these communications object visible, it must link to an appropriate group address. Otherwise status LEDs will not function correctly.				
3	Button 1…12 Lock	0=Unlock; 1=Lock 0=Lock; 1=Unlock	1 bit DPT 1.001 1 bit DPT 1.006	CW
Push button can be locked/unlocked via this object.				
4	Button 1…12 Lock and Status	0=Unlock; 1=Lock 0=Lock; 1=Unlock	1 bit DPT 1.001 1 bit DPT 1.006	CRWT
Push button can be locked/unlocked via this object. Additionally, Switch Lock status can be taken via same object.				

4.4.2. Switch and Dim

When push button function selected as “Switch and Dim” push button can be configured in three different ways to control brightness value.

	Short Touch	Long touch
Darker(Short Touch Off)	Off (%0)	Decrease, (%XX)
Brighter(Short Touch On)	On(%100)	Increase,(%XX)
Darker/Brighter(Short Touch Toggle)	Toggle between Darker/Brighter	Decrease, (%XX) / Increase,(%XX)

%XX values can have different values relative to the “Dimming Type” parameter. “Dimming Type” parameter allows two different types of dimming functionality “Start Stop” and “Step Wise”.

Dimming - Start Stop Type

When push button touched (and not released) and touched duration exceeds “Long Touch Duration” time “Increase, %100” (When button in Brighter mode) or “Decrease, %100” (When button in Darker mode) dimming level will be send using respective communication object. When button released “Increase, Break” or “Decrease, Break” value will be sent.

Dimming - Step Wise Type

When push button touched (and not released) and touched duration exceeds “Long Touch Duration” time, a step value level configured in “Step Value” parameter will be send using respective communication object. If button mode is “Darker”, “Decrease, % [Step Value]”, else button mode is “Brighter”, “Increase, % [Step Value]” values will be sent. Until button is released same step value will be send periodically with a time interval defined in “Step Send Interval”.

4.4.2.1. Parameters

Parameter	Setting	Description
Dim Operation	Darker (Short Touch Off) Brighter (Short Touch On) **Darker/Brighter (Short Touch Toggle)**	Select push button dim operation. (For more information Chapter 4.4.2.2)
Long Press Duration	100ms … **500ms** … 10s	Long Press time to start dimming.
Dimming Type	**Start Stop** / Step Wise	Select dimming type. (For more information Chapter 4.4.2.2)
Step Value	%100 / %50 / %25 / **%12.5** / %6.25 / %3.13 / % 1.56	Visible when dimming type is Step Wise. Selects the dimming resolution that will be sending at every “Step Send Interval”.
Step Send Interval	100ms … **1s** … 10s	Visible when dimming type is Step Wise. Selects the time interval to send dimming increase/decrease values.
Separate Switch Status Object	checked / **unchecked**	This parameter defines the additional obtect to write switch status.
Function of LED	LED Status ON LED Status OFF Operation Indication **Status Indication** Inverted Status Indication	This parameter is used to select status LED function of button.

4.4.2.2. Communication Objects

No	Object Name	Function	Data Point Type	Flags
1	Button 1…12	Telegr.switch	1 bit DPT 1.001	C(W)T
On/Off telegrams will be sent to group address that is linked to this communication object.				
2	Button 1…12	Telegr.dimming	4 bit DPT 3.007	CT
Dimming values will be send to group address that is linked to this communication object.				
3	Button 1…12	Switch Status	1 bit DPT 1.002	CWT
Confirmation for On/Off switch telegrams will be received from this communication object. If these communications object visible, it must link to an appropriate group address. Otherwise status LEDs will not function correctly. If status confirmation not to be used the communication object should be disabled by “Separate Comm Object” parameter.				
4	Button 1…12 Lock	0=Unlock; 1=Lock 0=Lock; 1=Unlock	1 bit DPT 1.001 1 bit DPT 1.006	CW
Push button can be locked/unlocked via this object.				
5	Button 1…12 Lock and Status	0=Unlock; 1=Lock 0=Lock; 1=Unlock	1 bit DPT 1.001 1 bit DPT 1.006	CRWT
Push button can be locked/unlocked via this object. Additionally, Switch Lock status can be taken via same object.				

4.4.3. Shutter

Selecting “Shutter” for “Push Button Function” enables shutter operation for push buttons. Shutter functions can be configured to control two different shutter operations “Shutter/Venetian Blind” function or “Blind/Roller/Awning” function. In both functions push button can be configured as 3 different button function; Up, Down and Toggle. When push button selected as up or down, that button can only move the blind and lamella to the configured direction. For example, if configured as up button, push button can be used to move the blind up and adjust the lamella down. If push button configured as toggle button, single button can be used to move the blind up – down and adjust lamella up – down.

Shutter/Venetian Blind Function

When “Controller Type” configured as “Shutter/Venetian Blind”, lamella operations of blind control will be enabled as “short press” function of the push button. Also, “Button Function” parameter enables the use of push button 3 different ways;

Up: “Long Press” moves the blind upwards; “Short Press” operates two different ways, short pressed while the blind is moving, stops the blind, short pressed while the blind is not moving adjust the lamella position down.

Down: “Long Press” moves the blind downwards; “Short Press” operates two different ways, short pressed while the blind is moving, stops the blind, short pressed while the blind is not moving adjust the lamella position up.

Toggle: “Long Press” moves the blind upwards or downwards toggling the last “Long Press” action. For example, if last state was up, when push button long pressed, it will send “Down” telegram.

Every time push button long pressed it will toggle its last state. If push button short pressed while the blind is moving upward or downward “Short Press” will stop the blind, if the blind is not moving “Short Press” will adjust the lamella. Lamella adjustment will operate respective to the last state, for example if the last “Long Press” action was up, then lamella will be adjusted down when push button short pressed and if the last “Long Press” action was down, then lamella will be adjusted up when push button short pressed.

Blind/Roller/Awning Function

When “Controller Type” configured as “Blind/Roller/Awning Function” lamella operations of blind control will be disabled and “short press” will only stop the movement of the blind. “Button Function” parameter enables the use of push button 3 different ways;

Up: “Short Press” moves the blind upwards; “Short Press” stops the blind.

Down: “Short Press” moves the blind downwards; “Short Press” stops the blind.

Toggle: “Short Press” action moves the blind downwards – stops – upwards – stops.

For example, if last state was up, when push button short pressed it will send “Stop” telegram.

Every time push button short pressed it will follow the steps below.

Down -> Stop -> Up -> Stop

Note: If Top or Bottom Position object gets a value “1” and short pressed, blind will be driven opposite way.

4.4.3.1. Parameters

Parameter	Setting	Description
Push Button Function	**Up** / Down / Toggle	Chapter 4.4.3
Control Type	**Shutter/Venetian Blind** Blind/Roller/Awning	Selects control type of blinds. Shutter/Venetian Blind function includes "Lamella Control" and "Blind/Roller/Awning" function does not include "Lamella Control".
Long Touch Duration	100ms … **300ms** … 10s	Wait time for long press action. This parameter will be shown if Control Type is selected as "Shutter/Venetian blind".
Function of LED	LED Status ON LED Status OFF Operation Indication **Status and Movement Indication** Inverted Status and Movement Indication Movement Indication	This parameter is used to select status LED function of button.

4.4.3.2. Communication Objects

No	Object Name	Function	Data Point Type	Flags
1	Button 1…12	Telegr.shutter UP/DOWN	1 bit DPT 1.008	CWT
Blind Up/Down telegrams will be sent via group address that is linked to this communication object.				
2	Button 1…12	Telegr.STOP/Lamella Adj.	1 bit DPT 1.007	CWT
This object will be shown If blind control type is selected as "Shutter Venetian Blind". Blind STOP and Lamella Adj. telegrams will be sent via group address that is linked to this communication object.				
3	Button 1…12	Telegr.STOP	1 bit DPT 1.007	CWT
This object will be shown If blind control type is selected as "Blind/Roller/Awning". Blind STOP telegrams will be sent via group address that is linked to this communication object.				
4	Button 1…12	Top Position	1 bit DPT 1.002	CW
Blind TOP Position object should be linked to this group object.				
5	Button 1…12	Bottom Position	1 bit DPT 1.002	CW
Blind BOTTOM Position object should be linked to this group object.				
6	Button 1…12 Lock	0=Unlock; 1=Lock 0=Lock; 1=Unlock	1 bit DPT 1.001 1 bit DPT 1.006	CW
Push button can be locked/unlocked via this object.				
7	Button 1…12 Lock and Status	0=Unlock; 1=Lock 0=Lock; 1=Unlock	1 bit DPT 1.001 1 bit DPT 1.006	CRWT
Push button can be locked/unlocked via this object. Additionally, Switch Lock status can be taken via same object.				

4.4.4. Value Operation

Push button can be configured to send predefined values from different Data Types. Additionally, long, short or double press actions can be selected for each Value transmitting individually. Up to 4 value can be sent via one button.

4.4.4.1. Parameters

Parameter	Setting		Description
	FUNCTION		
Value 1	None / **Short Press** / Double Press / Long Press		Value transmitting methods can be selected.
Value 2	**None** / Short Press / Double Press / Long Press		
Value 3	**None** / Short Press / Double Press / Long Press		
Value 4	**None** / Short Press / Double Press / Long Press		
Data Type	1-bit 1-bit HVAC control mode 1-bit toggle 1-byte unsigned 1-byte signed 1-byte HVAC operating mode 1-byte percentage 1-byte counter	1-byte scene activate 1-byte scene learn 2-byte unsigned 2-byte signed 2-byte float 4-byte unsigned 4-byte signed 4-byte float	Data type can be selected individually for each Value field.
Value	**0**/1		Visible when "Data Type" selected as "1 bit value".
	0…255		Visible when Data Type is selected as "1-byte unsigned"
	-128…**0**…127		Visible when Data Type is selected as "1-byte signed"
	Auto / Comfort / Standby / Economy / Building Protection		Visible when Data Type is selected as "1-byte HVAC operating mode"
	0…100 %		Visible when Data Type is selected as "1-byte percentage"
	0…65535		Visible when Data Type is selected as "2-byte unsigned"
	–32768…**0**…32767		Visible when Data Type is selected as "2-byte signed"
	–671088…**0**…670760		Visible when Data Type is selected as "2-byte float"
	0…4294967295		Visible when Data Type is selected as "4-byte unsigned"
	–2147483648…**0**…2147483647		Visible when Data Type is selected as "4-byte signed"
	–1E+38…**0**…1E+38		Visible when Data Type is selected as "4-byte float"
Begin	0/**1**		Visible when Data Type is selected as "1-bit toggle"

Parameter	Setting	Description
Begin	**0**…255	Visible when Data Type is selected as “1-byte counter”
End	0…**255**	
Step	0…**1**…255	
Step Direction	**Up** / Down	
Counting Sequence	**Cyclic** / Non-Cyclic	
Scene	**1**…64	Visible when Data Type is selected as “1-byte scene activate”
		Visible when Data Type is selected as “1-byte scene learn”
Double Press Timeout	**20**…200 x10 ms	Double press must be finished until timeout.
Long Press Duration	100ms…**1s**…10s	Select time period for long press operation
Long Press Repeat	checked / **unchecked**	
Long Press Repeat Interval	100ms…**200ms**…10s	
Function of LED	LED Status ON LED Status OFF Operation Indication **Status Indication** Inverted Status Indication	This parameter is used to select status LED function of button.

4.4.4.4. Communication Objects

No	Object Name	Function	Data Point Type	Flags
1	Button 1…12 [Short Press 1..4] Button 1…12 [Double Press 1…4] Button 1…12 [Long Press 1…4]	Telegr.value[0, 1]	1 bit DPT 1.001	CT
2		Telegr.value HVAC Control Mode	1 bit DPT 1.100	CT
2		Telegr.value[0…255]	1 Byte DPT 5.010	CT
2		Telegr.value[-127,128)	1 Byte DPT 6.010	CT
2		Telegr.value HVAC Mode	1 Byte DPT 20.102	CT
3		Telegr.value[0…100 %]	1 Byte DPT 5.001	CT
3		Telegr.value(1…64 scene)	1 Byte DPT 18.001	CT
3		Telegr.value[0…65535]	2 Byte DPT 7.001	CT
3		Telegr.value[-32768…32767]	2 Byte DPT 8.001	CT
4		Telegr.value(2-byte float)	2 Byte DPT 9.001	CT
5		Telegr.value(4-byte unsigned)	4 Byte DPT 12.001	CT
6		Telegr.value(4-byte signed)	4 Byte DPT 13.001	CT
7		Telegr.value(4-byte float)	4 Byte DPT 14.005	CT
8	Button 1…12 Lock	0=Unlock; 1=Lock 0=Lock; 1=Unlock	1 bit DPT 1.001 1 bit DPT 1.006	CW
Push button can be locked/unlocked via this object.				
9	Button 1…12 Lock and Status	0=Unlock; 1=Lock 0=Lock; 1=Unlock	1 bit DPT 1.001 1 bit DPT 1.006	CRWT
Push button can be locked/unlocked via this object. Additionally, Switch Lock status can be taken via same object.				
10	Button 1…12 LED Status	[0,1]	1 bit DPT 1.001	CW
Confirmation for On/Off switch telegrams will be received from this communication object. If these communications object visible, it must link to an appropriate group address. Otherwise status LEDs will not function correctly.				

4.5. Thermostat

4.5.1. LED Configuration

Brightness and colors can be selected in this parameter page.

4.5.1.1. Parameters

Parameter	Setting	Description
LCD BACKLIGHT		
Brightness	**Bright**, Dark, Off	Selects LCD Backlight brightness level.
Color	Red, Yellow, Green, Cyan, Blue, Magenta, **White**, Thermocolor	Selects LCD Backlight color. This parameter won't be shown If brightness is selected as "Off".
FAN SPEED BUTTON		
Brightness	Bright, Dark, **Off**	Selects Fan Speed Button brightness level.
Color	**Red**, Yellow, Green, Cyan, Blue, Magenta, White, Thermocolor	Selects Fan Speed Button color. This parameter won't be shown If brightness is selected as "Off".
OPERATING MODE BUTTON		
Brightness	Bright, Dark, **Off**	Selects Operating Mode Button brightness level.
Color	**Red**, Yellow, Green, Cyan, Blue, Magenta, White, Thermocolor	Selects Operating Mode Button color. This parameter won't be shown If brightness is selected as "Off".
SETPOINT INCREMENT BUTTON		
Brightness	Bright, Dark, **Off**	Selects Setpoint Increment Button brightness level.
Color	**Red**, Yellow, Green, Cyan, Blue, Magenta, White, Thermocolor	Selects Setpoint Increment Button color. This parameter won't be shown If brightness is selected as "Off".
SETPOINT DECREMENT BUTTON		
Brightness	Bright, Dark, **Off**	Selects Setpoint Decrement Button brightness level.
Color	**Red**, Yellow, Green, Cyan, Blue, Magenta, White, Thermocolor	Selects Setpoint Decrement Button color. This parameter won't be shown If brightness is selected as "Off".

4.5.2. Temperature Sensor

Temperature sensor and temperature status parameters should be configured from “Temperature Sensor” tab.

4.5.2.1. Parameters

Parameter	**Function**	**Description**
Temperature Unit	**Celsius(°C)** / Fahrenheit(°F)	Select temperature unit. After selection all temperature related parameters and communication objects should be enter as selected unit.
LCD Temperature Unit Object	checked / **unchecked**	Temperature unit can be changed via object.
Internal Sensor Offset	-128…**0**…127 (x0.1K)	Offset value entered here will be added to measured temperature. It can be used to compensate for temperature difference caused by thermostat placement. Entered value will be multiplied with 0.1
Send Temperature	**Cyclic** / Cyclic and Change	Selects whether temperature will be sent periodically or periodically and in case of a change in temperature. Minimum change value defined in “Minimum Difference” parameter.
Cyclic Sending Interval	10…**30**…65535 s	Cyclic time period to send temperature from “Current Temperature” communication object.
Minimum Change	**1**…255 (0.1K)	Only visible if “Send Temperature” selected as “Cyclic and Change”. Selects minimum change in temperature that will trigger transmission of temperature.
Temperature Measurement	**Internal Sensor**	Temperature info can be taken from internal, external KNX temp sensor or weighted average of both sensors. If External or Weighted is selected, “*External Temperature Sensor*” group object will be appeared.
	External Sensor	
	Weighted Average	
External Sensor Temp. Unit	Celsius	External sensor temp unit can be set as desired. If the “Same” is selected, the temp unit will be the same as well as Main Temperature Unit.
	Fahrenheit	
	Same	

Parameter	Function	Description
External Sensor Monitoring Timeout	15…**30**…65535 s	If “External Temperature Sensor” object value has not been updated at the end of the monitoring timeout, the temperature reading will fallback to Internal Sensor.
External Sensor Weight	1...**50**...99 %	This parameter appears when the Temperature Measurement is selected as "Weighted Average". In this case, External Temperature value weightness can be selected. For e.g. Weight is 20% , Internal Sensor is 24°C and External Sensor is 26°C. The result will be = (24x0.8)+(26x0.2) = **24.4°C**
Temperature Shown on LCD	**Internal Sensor**	This parameter allows to show current temperature from Internal or External Sensor on LCD Screen
	External Sensor	
Temperature Shown on KNX	**Internal Sensor**	This parameter allows to show current temperature from Internal or External Sensor via KNX object “Current Temperature.
	External Sensor	
Spot Temperature Sensor	checked / **unchecked**	This parameters allows the limit the room temperature via using an external KNX Temperature sensor. It is using for heat / cool protection. When the heat or cool limit temperature is reached, the thermostat controller output will be set to zero. When this parameter is activated, a *"Spot Temperature Sensor"* object will be appeared.
Sensor Temp. Unit	Celsius	Spot sensor temp unit can be set as desired. If the “Same” is selected, the temp unit will be the same as well as Main Temperature Unit.
	Fahrenheit	
	Same	
Heat Limit Temperature	0...**28**...255 K	Heat Protection Value of Spot Temperature Sensor
Cool Limit Temperature	0...**18**...255 K	Cool Protection Value of Spot Temperature Sensor
Limit Protection Deactivation Hysteresis	1...**20**...255 x0.1K	This parameter determines the heat/cool limit deactivation hysteresis levels.It prevents switching between protection and regular mode due to small temperature changes.

Parameter	Function	Description
Limit Protection Activation Delay	**0**...65535 s	This parameter determines the switching delay to protection mode when the limit reached. It prevents switching between protection and regular mode due to limit temperature reaching for a short time.
Monitoring Timeout	15...**60**...65535 s	If “SpotTemperature Sensor” object value has not been updated at the end of the monitoring timeout, the temperature reading will fallback to Internal Sensor.

Table 24

4.5.3. Thermostat

Parameters related to thermostat control should be configured in this tab. Whether thermostat will be used for heating, cooling or both and heating, cooling or both with additional stage should be selected here. When any control is activated a new tab will be open under “Thermostat Parameters” tab. Controller operation should be configured in respective tabs for heating, cooling and if enabled fan control. When control mode selected as “Heat/Cool”, configuration parameters for switchover (transition from heating to cooling or vice versa) conditions should be entered here.

4.5.3.1. Parameters

Parameter	**Setting**	**Description**
Control Mode	**Heat** Cool Heat/Cool Heat with Additional Stage Cool with Additional Stage Heat/Cool with Heat Additional Stage Heat/Cool with Cool Additional Stage Heat/Cool with Heat/Cool Additional Stage	This parameter allows to choose the control mode of thermostat which is used for heating only, cooling only or both and heating, cooling or both with additional stages.
Control Objects of Main Stage	**Seperate** / Joint	Only visible when “Control Mode” is “Heat/Cool” or" Heat/Cool w/Additional Stage". This parameters allows to choose the control objects of Main Stage are merged or not.
Control Objects of Additional Stage	**Seperate** / Joint	Only visible when “Control Mode” is “Heat/Cool with Heat/Cool Additional Stage”. This parameters allows to choose the control objects of Additional Stage are merged or not.
Control Mode (Heat, Cool, Heat/Cool)		
Switchover Method	**Automatic** Manual (via Object) Manual (Local and via Object)	Selects whether control mode switchover will be controlled by thermostat or controlled manually using related communication object or local button.
Heat/Cool Switchover Hysteresis (+/-)	5…**15**…255 x0.1K	This parameter allows to set Temperature difference between ambient temperature and setpoint temperature to change Control mode. When the difference value is reached, the control mode will be changed automatically (if control mode switchover is automatic) or Heating or Cooling control will be shut down until the Control Mode change manually.
DPT Switchover Object	**1 Bit [DPT_Heat/Cool]** 1 Byte [DPT_HVAC_Control_Mode]	Selects the control mode switchover communication object type.

Parameter	Setting	Description
Switchover Cyclic Sending Interval	1…**5**…255 min	Selects cyclic time period (in minutes) to transmit control mode switchover object.
Operating Mode (Comfort, Night, Away, Protect)		
Operating Modes	Comfort Comfort, Protection Comfort, Night, Protection **Comfort, Night, Away, Protection**	This parameter allows to select Operating Modes.
DPT Operating Mode Object	**1 Byte [DPT_HVAC_Mode]** Bit Objects	Selects the data type for operating mode switchover communication objects type.
DPT Operating Mode Status Object	**1 Byte [DPT_HVAC_Mode]** Bit Objects	Selects the data type for operating mode status communication objects type.

4.5.3.3. Control Types

Thermostat uses 5 different control types; these are PI Continuous, PI- PWM, On/Off, Fan Coil and Split. This control types can be used for Additional Control as well. Operation of every control type will be explained in the following chapters.

	Control Type	Output Type	Fan
PI Continuous	PI	1 byte (%0…%100)	Disabled
PI-PWM	PI	1 bit (On - Off)	Disabled
On/Off	On/Off	1 bit(On - Off)	Disabled
Fan Coil	PI	1 byte (%0…%100)	Enabled
Split	None	None	Enabled

Table 28

4.5.3.3.1. Main Stages

4.5.3.3.1.1. PI Continuous

Uses PI algorithm to calculate control signal and 1 byte (%0…%100) floating values as output, PI values should be selected compatible with the room that wants to be controlled. Default values are given for an average room and for different rooms PI values must be readjusted for better performance. As a general rule;

KP value: Changes the speed of the control and decreasing KP value increase the control speed. If given too low might cause overshoot, and given too large cause control to operate too slow.

KI value: More inactive the system smaller KI value should be.

Note finding optimum values for a specific room might require some trial and error. Using default values as a reference point and increase and decreasing these values according to the directions given above might increase controller performance.

4.5.3.3.1.2. PI PWM

Uses PI algorithm as controller to calculate control signal and 1 bit value as output, since PI algorithm outputs 1 byte floating value PWM method used to realize this output as 1 bit. PWM (Pulse with Modulation) requires a PWM cycle as period and uses control output to calculate duty cycle. For example, PWM cycle: 10 min, PI output: %20, Then an "on" telegram will be send at the beginning of 10 min cycle and "off" telegram at 10*20/100 = 2 min. Note that PI values and PWM cycle should be selected appropriate to room. As a general rule more inactive the system larger the PWM cycle should be.

4.5.3.3.1.3. On/Off

On/Off controller operate as a simple switch around the given setpoint using hysteresis values. Hysteresis values prevent the thermostat from oscillation and give larger margin to turning heat or cool on or off. When system is more active hysteresis values should be given larger and more inactive values can be given smaller.

4.5.3.3.1.4. Fan Coil

Fan coil uses the same control type and same output type as "PI Continuous", only difference fan coil enables "Fan Control" parameters and communication objects

4.5.3.3.1.5. Split Unit

Split controller does not control directly the split AC, so ambient temperature must be controlled by split AC's controller. Therefore, "Ambient Temperature" and "Setpoint Temperature" of split ACs communication objects should be linked to "Current Temperature" and "Current Setpoint" communication objects. Otherwise, split unit will be unaware of setpoint and ambient temperature and temperature control will not function correctly.

"Split Heat" and "Split Cool" communication objects are given to only to notify the split AC when there is a control mode change (heat - cool). Also, If both heating and cooling controller is configured as "Split Unit", "Split Heat/Cool" communication object can be merged in "Thermostat Parameters" tab via

4.5.3.3.2. Additional Stages

Additional stages can be combined with 5 different ways which are heating with additional heating, cooling with additional cooling, heat/cool with additional heating, heating/cooling with additional cooling and heating/cooling with additional heating/cooling.

Additional stages can be activated always with main controller stage or difference to setpoint.

4.5.3.3.2.1. PI Continuous Additional Stage

This control type is the same as PI-Continuous except activation process. The activation process will be explained.

4.5.3.3.2.2. PI PWM Additional Stage

This control type is the same as PI-PWM except activation process. The activation process will be explained.

4.5.3.3.2.3. On/Off Additional Stage

This control type is the same as On/Off except activation process. The activation process will be explained.

4.5.3.3.2.4. Fan coil Additional Stage

This control type is the same as Fan Coil except activation process. The activation process will be explained.

4.5.3.3.2.5. Split Unit Additional Stage

This control type is the same as Split Unit except activation process. The activation process will be explained.

4.5.3.3.3. Heating Control Main Stages

Selection of the heating control type, parameters of the selected control type should be configured here.

5 Heating Control types are available which are PI Continuous, PI PWM, On/Off, FanCoil and Split Unit.

4.5.3.3.3.1. PI Continuous

4.5.3.3.3.1.1. Parameters

Parameter	**Setting**	**Description**
Control Value	**Normal** / Inverse	Invert the output of the controller. For example, if normal output is %80, then inverted output is %20.
Sending of Control Value	Cyclic / **Cyclic and Change**	Control values will be sent cyclically only or cyclical and "Minimum Change" of heating control value is reached.
Cyclic Sending Interval	1…**5**…255 min	Time period to send heating control value over “Heating Control Value” communication object.
Minimum Change	1...**4**...25 %	This parameter appears when the "Sending of Control Value" is selected as "Cyclic and Change". It determines minimum control output change for transmitting the heating control value.
Maximum Control Signal	0…**100 %**	Maximum control signal value.
Minimum Control Signal	**0**…100 %	Minimum control signal value
Spot Heat Protection	checked / **unchecked**	This parameter enables the Heat Protection via using Spot Temperature Sensor. Spot Temperature sensor must be enabled in "Temperature Sensor" page to show this parameter.
Controller Algorithm	**PID** / Alternative PI	Controller algorithm can be selected via using this parameter.
Proportional Band	1...**30**...255 x 0.1°C	This parameter shown when the "Controller Algorithm" is selected as "PID"
Ti	0...**60**...255 min	This parameter shown when the "Controller Algorithm" is selected as "PID"
Td	**0**...255 min	This parameter shown when the "Controller Algorithm" is selected as "PID"

Parameter	Setting	Description
Proportional Gain KP	1…**66**…255	This parameter shown when the "Controller Algorithm" is selected as "Alternative PI". Proportional gain of PI algorithm
Integral Gain Ki	1…**32**…255 /1000	This parameter shown when the "Controller Algorithm" is selected as "Alternative PI". Integral gain of PI algorithm, given value divided by 1000.
Reverse Differential Action Band	5…**15**…255 x 0.1	This parameter shown when the "Controller Algorithm" is selected as "Alternative PI". Reverse Differential Action Band, given value multiplied by 0.1

Table 29

4.5.3.3.3.2. PI PWM

4.5.3.3.3.2.1. Parameters

Parameter	Setting	Description
Control Value	**Normal** / Inverse	Invert the output of the controller. For example, if normal output is 1, then inverted output is 0.
PWM period	1...**10**...255 min	This parameter determines PWM period.
Signal Minimum Switching Time	**0**…255 s	This parameter determines additional time for minimum switching time. For e.g. The valve opening delay time can be covered with this parameter.
Maximum Control Signal	0…**100 %**	Maximum control signal value.
Minimum Control Signal	0…**5**…100 %	Minimum control signal value
Spot Heat Protection	checked / **unchecked**	This parameter enables the Heat Protection via using Spot Temperature Sensor. Spot Temperature sensor must be enabled in "Temperature Sensor" page to show this parameter.

Parameter	Setting	Description
Controller Algorithm	**PID** / Alternative PI	Controller algorithm can be selected via using this parameter.
Proportional Band	1...**30**...255 x 0.1°C	This parameter shown when the "Controller Algorithm" is selected as "PID"
Ti	0...**60**...255 min	This parameter shown when the "Controller Algorithm" is selected as "PID"
Td	**0**...255 min	This parameter shown when the "Controller Algorithm" is selected as "PID"
Proportional Gain KP	1...**66**...255	This parameter shown when the "Controller Algorithm" is selected as "Alternative PI". Proportional gain of PI algorithm
Integral Gain Ki	1...**32**...255 /1000	This parameter shown when the "Controller Algorithm" is selected as "Alternative PI". Integral gain of PI algorithm, given value divided by 1000.
Reverse Differential Action Band	5...**15**...255 x 0.1	This parameter shown when the "Controller Algorithm" is selected as "Alternative PI". Reverse Differential Action Band, given value multiplied by 0.1

Table 31

*[4] “PWM Cycle” and “Minimum Control Signal” parameters should be configured considering the limitations of the actuator. For example; when actuator is Solenoid valve with a response time of 120 seconds,

- PWM cycle configured as 10 minutes
- “Minimum Control Signal” should be bigger than 120*100/ (10*60) = %20
- PWM cycle configured as 20 minutes
- “Minimum Control Signal” should be bigger than 120*100/ (20*60) = %10

4.5.3.3.3.3. On/Off

4.5.3.3.3.3.1. Parameters

Parameter	Setting	Description
Control Value	**Normal** / Inverse	Invert the output of the controller. For example, if normal output is 1, then inverted output is 0.
Cyclic Sending Interval	1…**5**…255	Time period to send heating control value over “Heating Control Value” communication object.
Hysteresis (1/10 K)	1…**10**…255	Hysteresis value (Chapter 4.4.3.1.3)
Spot Heat Protection	checked / **unchecked**	This parameter enables the Heat Protection via using Spot Temperature Sensor. Spot Temperature sensor must be enabled in "Temperature Sensor" page to show this parameter.

Table 33

4.5.3.3.3.4. Fan Coil

Heating control parameters for fan coil controller type should be configured here.

4.5.3.3.3.4.1. Parameters

Parameter	Setting	Description
Control Value	**Normal** / Inverse	Invert the output of the controller. For example, if normal output is %80, then inverted output is %20.
Sending of Control Value	Cyclic / **Cyclic and Change**	Control values will be sent cyclically only or cyclical and "Minimum Change" of heating control value is reached.
Cyclic Sending Interval	1…**5**…255 min	Time period to send heating control value over “Heating Control Value” communication object.
Minimum Change	1...**4**...25 %	This parameter appears when the "Sending of Control Value" is selected as "Cyclic and Change". It determines minimum control output change for transmitting the heating control value.
Maximum Control Signal	0…**100 %**	Maximum control signal value.

Parameter	Setting	Description
Minimum Control Signal	**0**…100 %	Minimum control signal value
Spot Heat Protection	checked / **unchecked**	This parameter enables the Heat Protection via using Spot Temperature Sensor. Spot Temperature sensor must be enabled in "Temperature Sensor" page to show this parameter.
Controller Algorithm	**PID** / Alternative PI	Controller algorithm can be selected via using this parameter.
Proportional Band	1…**30**…255 x 0.1°C	This parameter shown when the "Controller Algorithm" is selected as "PID"
Ti	0…**60**…255 min	This parameter shown when the "Controller Algorithm" is selected as "PID"
Td	**0**…255 min	This parameter shown when the "Controller Algorithm" is selected as "PID"
Proportional Gain KP	1…**66**…255	This parameter shown when the "Controller Algorithm" is selected as "Alternative PI". Proportional gain of PI algorithm
Integral Gain Ki	1…**32**…255 /1000	This parameter shown when the "Controller Algorithm" is selected as "Alternative PI". Integral gain of PI algorithm, given value divided by 1000.
Reverse Differential Action Band	5…**15**…255 x 0.1	This parameter shown when the "Controller Algorithm" is selected as "Alternative PI". Reverse Differential Action Band, given value multiplied by 0.1

Table 35

4.5.3.3.3.5. Split Unit

Split unit controller does not directly control temperature, since temperature control is split unit's responsibility "Current Temperature" and "Current Setpoint" communication objects should be linked to split units "Ambient Temperature" and "Setpoint Temperature" communication objects.

4.5.3.3.3.5.1. Parameters

Parameter	**Setting**	**Description**
Cyclic Sending Interval	1…**5**…255 min	Time period to send heating control value over "Heating Control Value" communication object.
Communication Error Object	Enable / **Disable**	Enables "Split Heat Error" communication object. "True" telegram from this communication objects cause thermostat to enter "Protection Mode" with error. (For more information Chapter 4.5.2)
Spot Heat Protection	checked / **unchecked**	This parameter enables the Heat Protection via using Spot Temperature Sensor. Spot Temperature sensor must be enabled in "Temperature Sensor" page to show this parameter.

Table 37

4.5.3.3.4. Heating Control Additional Stages

Selection of the additional heating control type, parameters of the selected control type should be configured here.

5 Additional Heating Control types are available which are PI Continuous, PI PWM, On/Off, FanCoil and Split Unit.

4.5.3.3.4.1. PI Continuous

4.5.3.3.4.1.1. Parameters

Parameter	**Setting**	**Description**
Control Value	**Normal** / Inverse	Invert the output of the controller. For example, if normal output is %80, then inverted output is %20.
Sending of Control Value	Cyclic / **Cyclic and Change**	Control values will be sent cyclically only or cyclical and "Minimum Change" of heating control value is reached.
Cyclic Sending Interval	1…**5**…255 min	Time period to send heating control value over “Heating Control Value” communication object.
Minimum Change	1...**4**...25 %	This parameter appears when the "Sending of Control Value" is selected as "Cyclic and Change". It determines minimum control output change for transmitting the heating control value.
Maximum Control Signal	0…**100 %**	Maximum control signal value.
Minimum Control Signal	**0**…100 %	Minimum control signal value
Spot Heat Protection	checked / **unchecked**	This parameter enables the Heat Protection via using Spot Temperature Sensor. Spot Temperature sensor must be enabled in "Temperature Sensor" page to show this parameter.
Controller Algorithm	**PID** / Alternative PI / Disabled	Controller algorithm can be selected via using this parameter.
Proportional Band	1...**30**...255 x 0.1°C	This parameter shown when the "Controller Algorithm" is selected as "PID"

Parameter	Setting	Description
Ti	0...**60**...255 min	This parameter shown when the "Controller Algorithm" is selected as "PID"
Td	**0**...255 min	This parameter shown when the "Controller Algorithm" is selected as "PID"
Proportional Gain KP	1...**66**...255	This parameter shown when the "Controller Algorithm" is selected as "Alternative PI". Proportional gain of PI algorithm
Integral Gain Ki	1...**32**...255 /1000	This parameter shown when the "Controller Algorithm" is selected as "Alternative PI". Integral gain of PI algorithm, given value divided by 1000.
Reverse Differential Action Band	5...**15**...255 x 0.1	This parameter shown when the "Controller Algorithm" is selected as "Alternative PI". Reverse Differential Action Band, given value multiplied by 0.1
Additional Stage Activation	Always / **On Difference to Setpoint**	Additional Stage can be activated always or depends to setpoint difference.
Activation Difference (Away from Setpoint)	10...**40**...255 x 0.1K	Additional stage will be activated depends on temperature difference between current temperature and setpoint. Given value will be multiplied with 0.1
Deactivation Difference (Close to Setpoint)	1...**10**...255 x 0.1K	Additional stage will be deactivated depends on temperature difference between current temperature and setpoint. Given value will be multiplied with 0.1
Controller Algorithm Hysteresis Override	checked / **unchecked**	The controller algoritm will be disabled when this parameter is selected. When this parameter is selected, the maximum control signal of additional stage will be applied.

Table 29

4.5.3.3.4.2. PI PWM

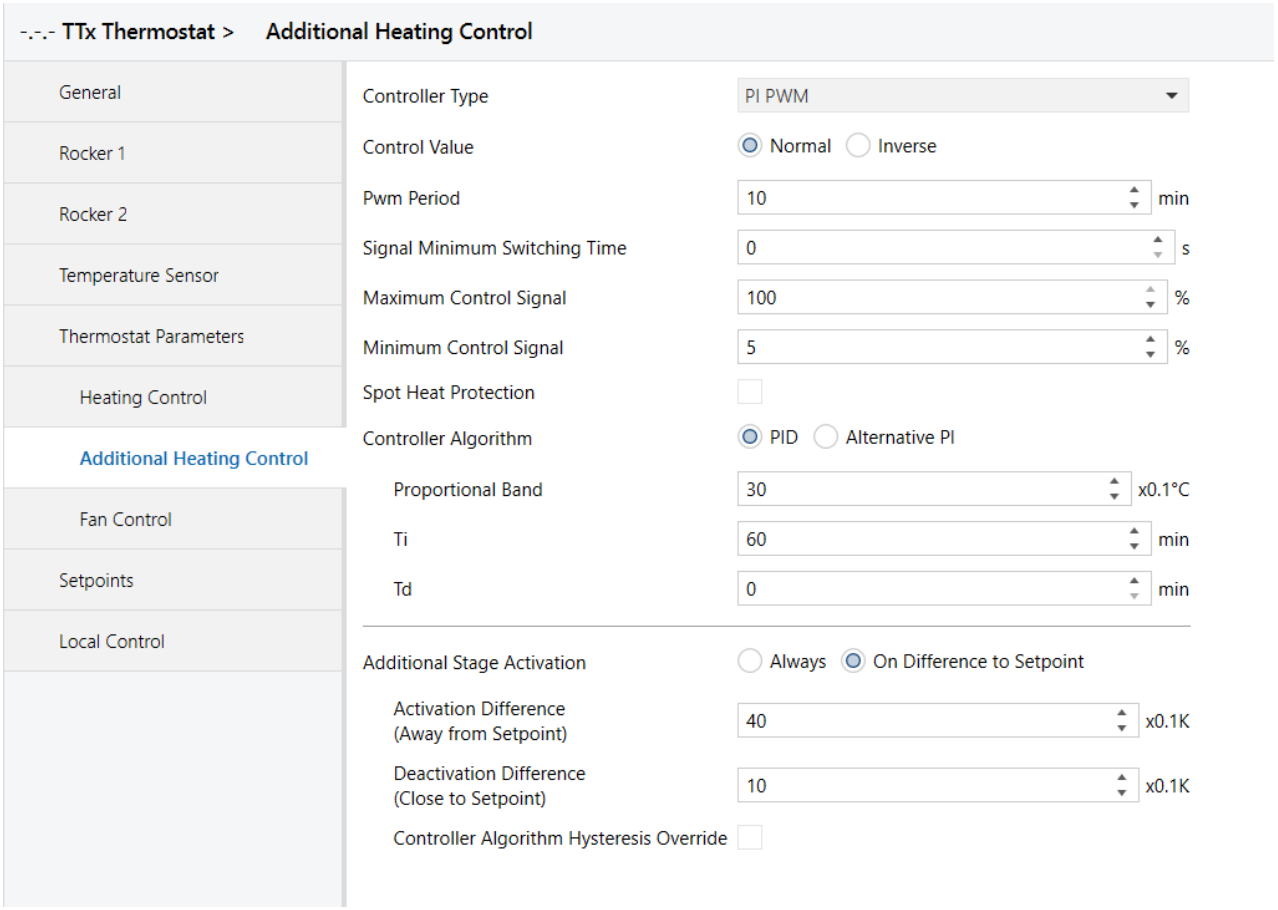


Figure 15

For more information how the PI parameters and PWM cycle should be selected Chapter 4.4.3.1.2

4.5.3.3.4.2.1. Parameters

Parameter	**Setting**	**Description**
Control Value	**Normal** / Inverse	Invert the output of the controller. For example, if normal output is 1, then inverted output is 0.
PWM period	1...**10**...255 min	This parameter determines PWM period.
Signal Minimum Switching Time	**0**...255 s	This parameter determines additional time for minimum switching time. For e.g. The valve opening delay time can be covered with this parameter.

Parameter	Setting	Description
Maximum Control Signal	0…**100 %**	Maximum control signal value.
Minimum Control Signal	0…**5**…100 %	Minimum control signal value
Spot Heat Protection	checked / **unchecked**	This parameter enables the Heat Protection via using Spot Temperature Sensor. Spot Temperature sensor must be enabled in "Temperature Sensor" page to show this parameter.
Controller Algorithm	**PID** / Alternative PI	Controller algorithm can be selected via using this parameter.
Proportional Band	1…**30**…255 x 0.1°C	This parameter shown when the "Controller Algorithm" is selected as "PID"
Ti	0…**60**…255 min	This parameter shown when the "Controller Algorithm" is selected as "PID"
Td	**0**…255 min	This parameter shown when the "Controller Algorithm" is selected as "PID"
Proportional Gain KP	1…**66**…255	This parameter shown when the "Controller Algorithm" is selected as "Alternative PI". Proportional gain of PI algorithm
Integral Gain Ki	1…**32**…255 /1000	This parameter shown when the "Controller Algorithm" is selected as "Alternative PI". Integral gain of PI algorithm, given value divided by 1000.
Reverse Differential Action Band	5…**15**…255 x 0.1	This parameter shown when the "Controller Algorithm" is selected as "Alternative PI". Reverse Differential Action Band, given value multiplied by 0.1
Additional Stage Activation	Always / **On Difference to Setpoint**	Additional Stage can be activated always or depends to setpoint difference.

Parameter	Setting	Description
Activation Difference (Away from Setpoint)	10...**40**...255 x 0.1K	Additional stage will be activated depends on temperature difference between current temperature and setpoint. Given value will be multiplied with 0.1
Deactivation Difference (Close to Setpoint)	1...**10**...255 x 0.1K	Additional stage will be deactivated depends on temperature difference between current temperature and setpoint. Given value will be multiplied with 0.1
Controller Algorithm Hysteresis Override	checked / **unchecked**	The controller algoritm will be disabled when this parameter is selected. When this parameter is selected, the control signal of additional stage will be "1" during activated.

Table 31

*[4] “PWM Cycle” and “Minimum Control Signal” parameters should be configured considering the limitations of the actuator. For example; when actuator is Solenoid valve with a response time of 120 seconds,

- PWM cycle configured as 10 minutes (Chapter 4.4.3.1.2)

- “Minimum Control Signal” should be bigger than 120*100/ (10*60) = %20

- PWM cycle configured as 20 minutes

- “Minimum Control Signal” should be bigger than 120*100/ (20*60) = %10

4.5.3.3.4.3. On/Off

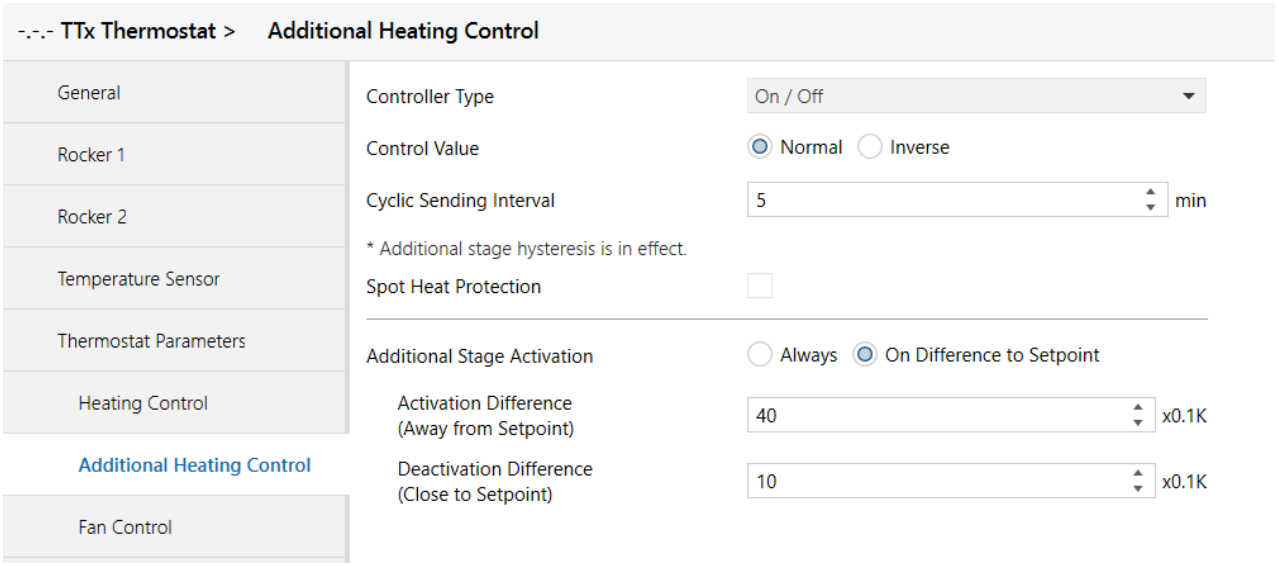


Figure 16

Heating control parameters for on/off controller type should be configured here. For more information about on/off controller read Chapter 4.4.3.1.3.

4.5.3.3.4.3.1. Parameters

Parameter	**Setting**	**Description**
Control Value	**Normal** / Inverse	Invert the output of the controller. For example, if normal output is 1, then inverted output is 0.
Cyclic Sending Interval	1…**5**…255 min	Time period to send heating control value over “Additional Heating Control Value” communication object.
Hysteresis (1/10 K)	1…**10**…255 x 0.1K	Hysteresis value (Chapter 4.4.3.1.3) This parameter will be enabled If the Additional Stage Activation is selected *"Always"*
Spot Heat Protection	checked / **unchecked**	This parameter enables the Heat Protection via using Spot Temperature Sensor. Spot Temperature sensor must be enabled in "Temperature Sensor" page to show this parameter.
Additional Stage Activation	Always / **On Difference to Setpoint**	Additional Stage can be activated always or depends to setpoint difference.

Parameter	Setting	Description
Activation Difference (Away from Setpoint)	10...**40**...255 x 0.1K	Additional stage will be activated depends on temperature difference between current temperature and setpoint. Given value will be multiplied with 0.1
Deactivation Difference (Close to Setpoint)	1...**10**...255 x 0.1K	Additional stage will be deactivated depends on temperature difference between current temperature and setpoint. Given value will be multiplied with 0.1

Table 33

4.5.3.3.4.4. Fan Coil

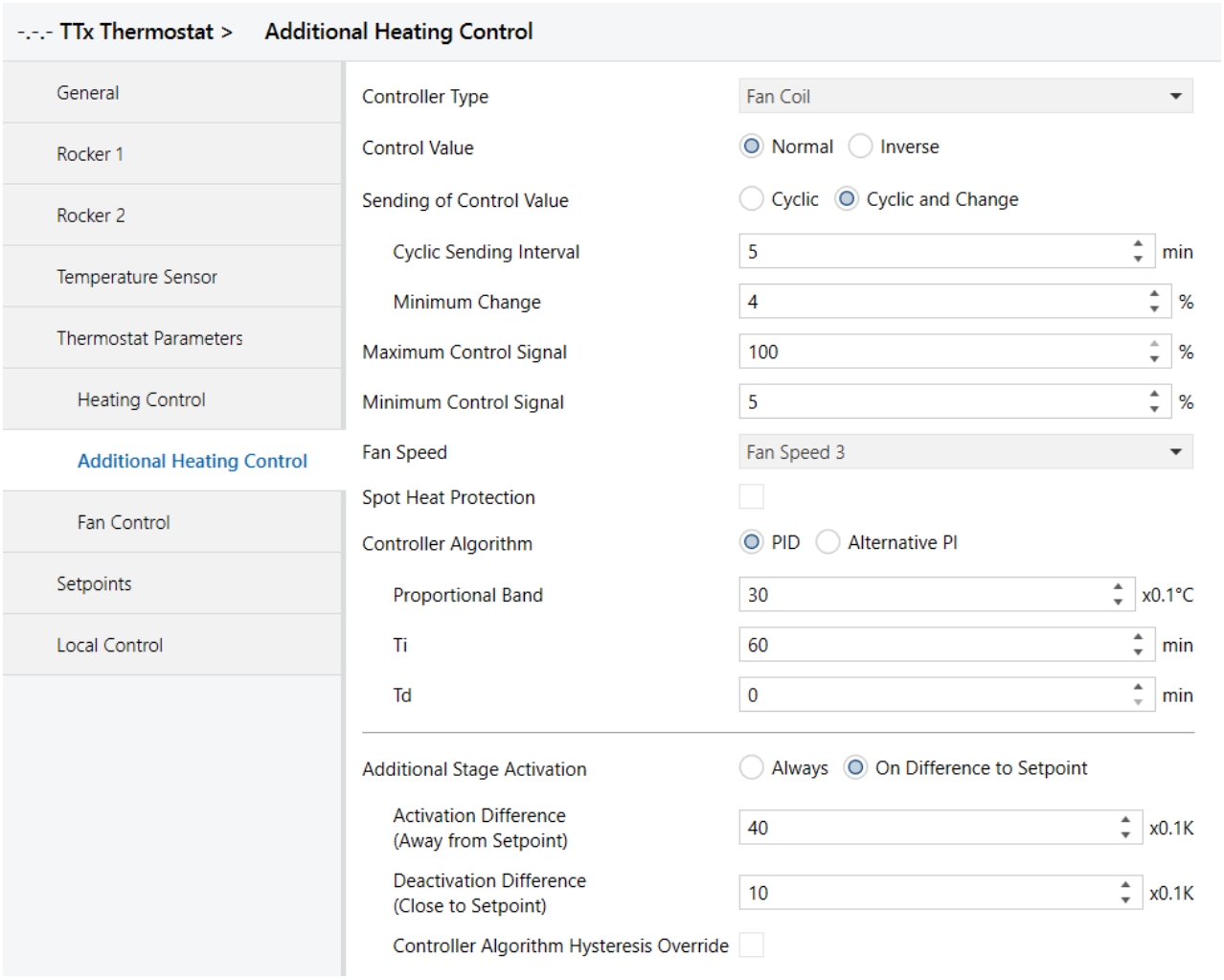


Figure 17

Heating control parameters for fan coil controller type should be configured here.

4.5.3.3.4.4.1. Parameters

Parameter	Setting	Description
Control Value	**Normal** / Inverse	Invert the output of the controller. For example, if normal output is %80, then inverted output is %20.
Control Value	Cyclic / **Cyclic and Change**	Control values will be sent cyclically only or cyclical and "Minimum Change" of heating control value is reached.
Cyclic Sending Interval	1…**5**…255 min	Time period to send heating control value over “Heating Control Value” communication object.
Minimum Change	1...**4**...25 %	This parameter appears when the "Sending of Control Value" is selected as "Cyclic and Change". It determines minimum control output change for transmitting the additional heating control value.
Fan Speed	Auto, Fan Speed 1, 2, **3**	Fan Speed of the Additional Fan Coil can be choosen when it is activated.
Maximum Control Signal	0…**100 %**	Maximum control signal value.
Minimum Control Signal	**0**…100 %	Minimum control signal value
Spot Heat Protection	checked / **unchecked**	This parameter enables the Heat Protection via using Spot Temperature Sensor. Spot Temperature sensor must be enabled in "Temperature Sensor" page to show this parameter.
Controller Algorithm	**PID** / Alternative PI / Disabled	Controller algorithm can be selected via using this parameter.
Proportional Band	1...**30**...255 x 0.1°C	This parameter shown when the "Controller Algorithm" is selected as "PID"
Ti	0...**60**...255 min	This parameter shown when the "Controller Algorithm" is selected as "PID"
Td	**0**...255 min	This parameter shown when the "Controller Algorithm" is selected as "PID"
Proportional Gain KP	1…**66**…255	This parameter shown when the "Controller Algorithm" is selected as

Parameter	Setting	Description
		"Alternative PI". Proportional gain of PI algorithm
Integral Gain Ki	1…**32**…255 /1000	This parameter shown when the "Controller Algorithm" is selected as "Alternative PI". Integral gain of PI algorithm, given value divided by 1000.
Reverse Differential Action Band	5…**15**…255 x 0.1	This parameter shown when the "Controller Algorithm" is selected as "Alternative PI". Reverse Differential Action Band, given value multiplied by 0.1
Additional Stage Activation	Always / **On Difference to Setpoint**	Additional Stage can be activated always or depends to setpoint difference.
Activation Difference (Away from Setpoint)	10...**40**...255 x 0.1K	Additional stage will be activated depends on temperature difference between current temperature and setpoint. Given value will be multiplied with 0.1
Deactivation Difference (Close to Setpoint)	1...**10**...255 x 0.1K	Additional stage will be deactivated depends on temperature difference between current temperature and setpoint. Given value will be multiplied with 0.1
Controller Algorithm Hysteresis Override	checked / **unchecked**	The controller algoritm will be disabled when this parameter is selected. When this parameter is selected, the control signal of additional stage will be 100% during activated.

Table 35

4.5.3.3.4.5. Split Unit

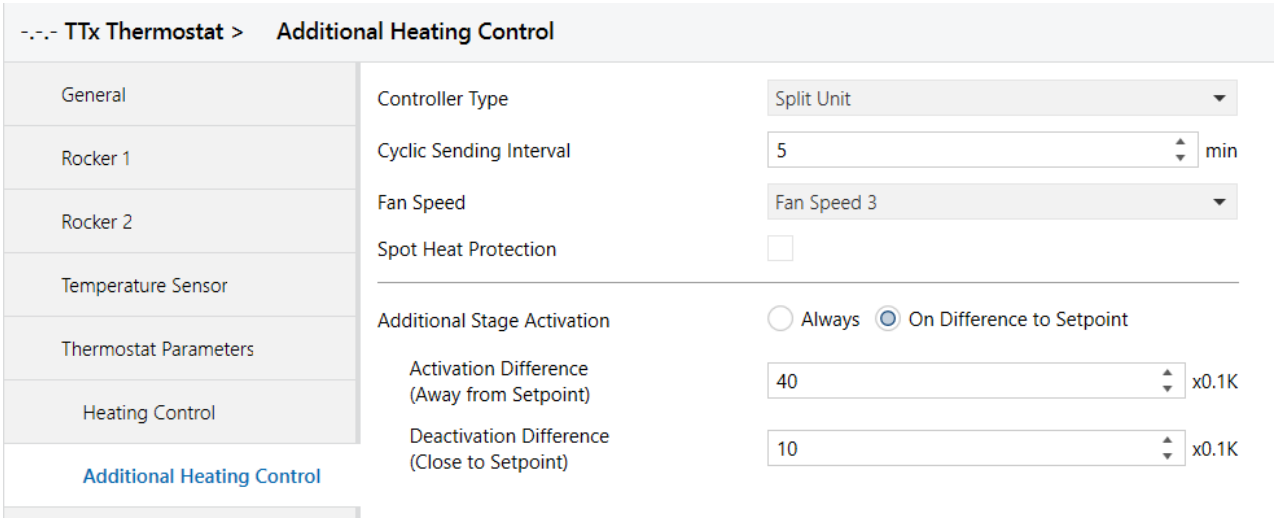


Figure 18

Split unit controller does not directly control temperature, since temperature control is split unit's responsibility "Current Temperature" and "Current Setpoint" communication objects should be linked to split units "Ambient Temperature" and "Setpoint Temperature" communication objects.

4.5.3.3.4.5.1. Parameters

Parameter	**Setting**	**Description**
Cyclic Sending Interval	1…**5**…255 min	Time period to send heating control value over "Additional Heating Control Value" communication object.
Fan Speed	Auto, Fan Speed 1, 2, **3**	Fan Speed of the Additional Fan Coil can be choosen when it is activated.
Spot Heat Protection	checked / **unchecked**	This parameter enables the Heat Protection via using Spot Temperature Sensor. Spot Temperature sensor must be enabled in "Temperature Sensor" page to show this parameter.
Additional Stage Activation	Always / **On Difference to Setpoint**	Additional Stage can be activated always or depends to setpoint difference.
Activation Difference (Away from Setpoint)	10...**40**...255 x 0.1K	Additional stage will be activated depends on temperature difference between current temperature and setpoint. Given value will be multiplied with 0.1

Parameter	Setting	Description
Deactivation Difference (Close to Setpoint)	1...**10**...255 x 0.1K	Additional stage will be deactivated depends on temperature difference between current temperature and setpoint. Given value will be multiplied with 0.1

Table 37

4.5.3.3.5. Cooling Control Main Stages

Cooling control Main Stage parameters are the same as Heating Control Main Stage.

4.5.3.3.6. Cooling Control Additional Stages

Cooling control Additional Stage parameters are the same as Heating Control Additional Stage.

4.5.3.4. Fan Control

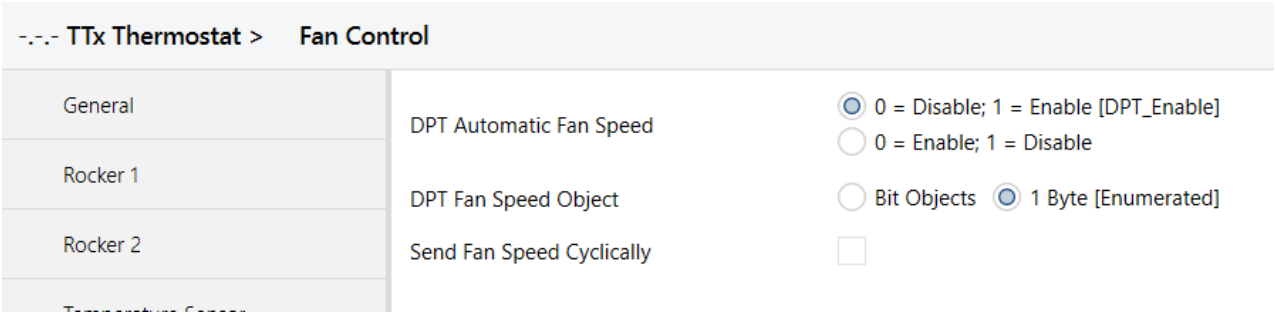


Figure 19

When heating control or cooling control selected as “Fan Coil” or “Split Unit”, “Fan Control” tab will be visible. Note that, if both heat and cool controllers configured as “Fan Coil” or “Split Unit”, only one set of communication objects and parameters for fan control will be enabled.

When fan control enabled, “Fan Speed” parameters of different operating modes in “Setpoints” tab will also be visible and “LCD Fan Speed” icons will be activated. Since fan speed communication objects are used as control objects and status objects, change in fan speed will be visible from LCD Fan Speed icons.

4.5.3.4.1. Parameter

Parameter	**Setting**	**Description**
DPT Automatic Fan Speed	**0 = Disable; 1 = Enable [DPT_Enable]** 0 = Enable; 1 = Disable	Telegram value to enable automatic fan speed might differ between different actuators; use this parameter to change the telegram value for enabling automatic fan speed.
DPT Fan Speed Object	Bit Objects / **1 Byte [Enumerated]**	Selects the data type to control fan speed.
Reset Values of Unselected Fan Objects	Yes / **No**	This parameter allows to transmit status of unused fan level in every fan speed change.
Additional Method for Turning Off Fan (Fan Coil only)	**Disabled** Transmit "0" at Fan Speed 1 Transmit "0" at Fan Speed 2 Transmit "0" at Fan Speed 3 Transmit "0" at Fan Speed 1 & 2 & 3	This parameter allows to transmit "0" value for turning off the fan levels.
Send Fan Speed Cyclically	checked / **unchecked**	This parameter allows to transmit the fan speed status periodically.

Cyclic Sending Interval	1…**5**…255 min	Time period to send heating control value over “Heating Control Value” communication object.
Also Send Auto-Fan Value	**checked** / unchecked	This parameter allows to transmit the "Fan Auto" status in every cycle.

Table 39

4.5.4. Setpoints

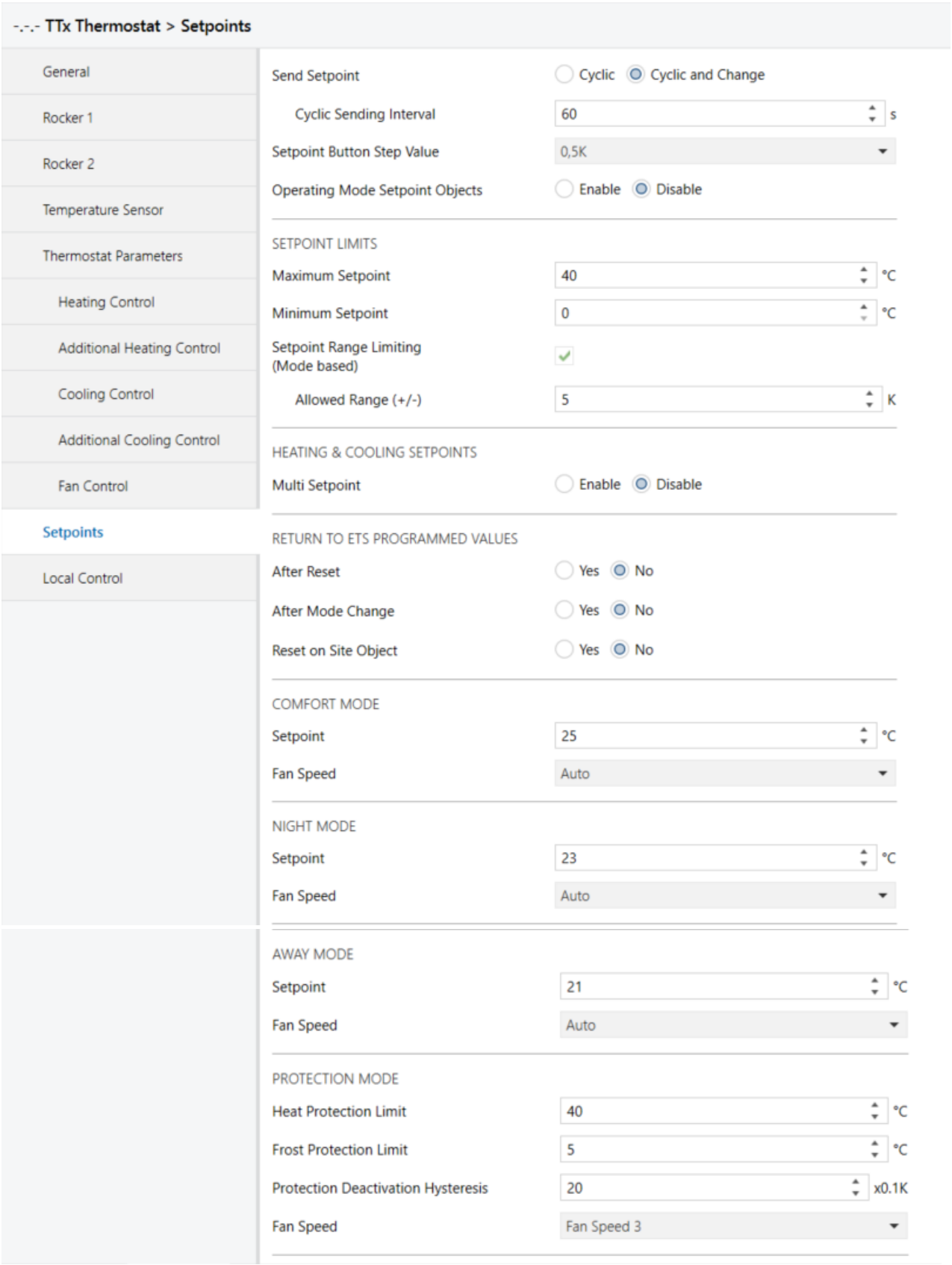


Figure 25

4.5.4.1. Parameters

Parameter	Setting	Description
Send Setpoint	Cyclic / **Cyclic and Change**	Control values will be sent cyclically only or cyclical and "Minimum Change" of heating control value is reached.
Cyclic Sending Interval	10…**60**…65535 s	Time period to send heating control value over “Heating Control Value” communication object.
Setpoint Button Step Value	0.1K, **0.5K**, 1K	This parameter determines the step value of Setpoint.
SETPOINT LIMITS		
Maximum Setpoint	0…**40**…99 °C / °F	This parameter determines the maximum value of Setpoint.
Minimum Setpoint	**0**…99 °C / °F	This parameter determines the minimum value of Setpoint.
Setpoint Range Limiting (Mode based)	**checked** / unchecked	This parameter is limitting the Setpoint changes.
Allowed Range (+/-)	1…**5**…30 K	This parameter is shown when the "Setpoint Range Limiting" is selected. Given value will be applied plus and minus side of Setpoint. For e.g. Limit is 5 and Comfort Setpoint 25 C. The setpoint can decrease until 20 C, increase until 30 C.
HEATING & COOLING SETPOINTS		
Multi Setpoint	Enable / **Disable**	This parameter will be available If the Control Mode Switchover is selected as *"Manual"* in Thermostat Parameters Screen.
RETURN TO ETS PROGRAMMED VALUES		
After Reset	Yes / **No**	Setpoint values will be returned to last ETS programmed values after device reset.
After Mode Change	Yes / **No**	Setpoint values will be returned to last ETS programmed values after any operating mode change.
Reset on Site Object	Yes / **No**	Setpoint values will be returned to last ETS programmed values after Reset on Site Object is enabled.

Parameter	Setting	Description
Reset on Site Value	0 / **1** / Any Value	This parameter allows to reset device using by group object.
COMFORT MODE		
Setpoint	0...**25**...99 °C / °F	This parameter allows to set default Setpoint Temperature of Comfort Mode.
Setpoint Heating	0...**25**...99 °C / °F	Multi Setpoint parameter must be enabled to see these parameters. Heating and Cooling setpoints for Comfort Mode can be set independently.
Setpoint Cooling	0...**25**...99 °C / °F	
Fan Speed	**Auto** / Fan Speed 1 / 2 / 3	Fan speed value can be set for Comfort Mode.
NIGHT MODE		
Setpoint	0...**23**...99 °C / °F	This parameter allows to set default Setpoint Temperature of Comfort Mode.
Setpoint Heating	0...**23**...99 °C / °F	Multi Setpoint parameter must be enabled to see these parameters. Heating and Cooling setpoints for Night Mode can be set independently.
Setpoint Cooling	0...**23**...99 °C / °F	
Fan Speed	**Auto** / Fan Speed 1 / 2 / 3	Fan speed value can be set for Night Mode.
AWAY MODE		
Setpoint	0...**21**...99 °C / °F	This parameter allows to set default Setpoint Temperature of Comfort Mode.
Setpoint Heating	0...**21**...99 °C / °F	Multi Setpoint parameter must be enabled to see these parameters. Heating and Cooling setpoints for Away Mode can be set independently.
Setpoint Cooling	0...**21**...99 °C / °F	
Fan Speed	**Auto** / Fan Speed 1 / 2 / 3	Fan speed value can be set for Away Mode.
PROTECTION MODE		
Heat Protection Limit	0...**40**...99 °C / °F	This parameter allows to define Heat Protection. When the heat protection limit temperature reached, the cooling mode will be activated automatically.
Frost Protection Limit	0...**5**...99 °C / °F	This parameter allows to define Frost Protection. When the frost protection limit temperature

Parameter	Setting	Description
		reached, the heating mode will be activated automatically.
Protection Deactivation Hysteresis	10...**20**...255 x0.1	This parameter determines the deactivation hysteresis of Protection Mode
Fan Speed	Auto / Fan Speed 1 / 2 / **3**	Fan speed value can be set for Protection Mode.

Table 41

4.5.5. Local Control

Figure 26

4.5.5.1. Parameters

Parameter	Setting	Description
Setpoint Button	**Enable** / Disable	Enable/Disable setpoint buttons on thermostat.
Operating Mode Button	**Enable** / Disable	Enable/Disable operating mode button on thermostat

Table 53

When any of the thermostat buttons disabled “Lock Icon” on the thermostat will be activated.

Disabling buttons will not affect secondary functions of those buttons.

For example, even setpoint buttons are disabled, long press of setpoint buttons will still operate as backlight dim.

4.6. Logic Block 1…2

4.6.1. I/O Configuration

Logic Input and Output counts should be selected in this page.

Parameter	Setting	Description
I/O Config	1 Input / 15 Output 2 Input / 14 Output 3 Input / 13 Output 4 Input / 12 Output 5 Input / 11 Output 6 Input / 10 Output 7 Input / 9 Output 8 Input / 8 Output 9 Input / 7 Output 10 Input / 6 Output 11 Input / 5 Output 12 Input / 4 Output 13 Input / 3 Output 14 Input / 2 Output **15 Input / 1 Output**	Logic Input and Output configuration can be selected.

4.6.2. Inputs

4.6.2.1. IN1…15

Parameter	Setting	Description
Name	25 chracters are allowed. (Optional)	Any name can be defined for each Input. Name will be shown in ETS Parameters and Group Objects page.
Data Type	**1 bit** / 1 byte	Logic Input Data Type can be selected.
Preprocess (if Data Type : 1 bit)	**Passthrough**, NOT, always True, always False	Passthrough: Input will be proccessed as it is. NOT: Input will be reverted. always True: Process will always be True regardless to input value. always False: Process will always be False regardless to input value.
Preprocess (if Data Type : 1 byte)	**Passthrough**, NOT, always True, always False, equal, NOT equal, in range, NOT in range, matches any of two, NOT matches any of two, bits SET, NOT bits SET, bits CLEAR, NOT bits CLEAR, thresholds, NOT thresholds	Passthrough: Input will be proccessed as it is. 0 is OFF, 1…255 is ON NOT: Input will be reverted. 0 is ON, 1…255 is OFF always True: Process will always be True regardless to input value. always False: Process will always be False regardless to input value. equal: If the Input value is equal to ETS written value, the result will be “True”. NOT equal: If the Input value is NOT equal to ETS written value, the result will be “True”. in range: If the Input value is in range between written values on ETS, the result will be “True”. NOT in range: If the Input value is NOT in range between written values on ETS, the result will be “True”. matches any of two: If the Input value matches with the any of values on ETS, the result will be “True”. NOT matches any of two: If the Input value does NOT match with the any of values on ETS, the result will be “True”. bits SET: If all masked bits of the Input Value is set, the result will be “True”. NOT bits SET: If all masked bits of the input value is set, the result will be “False” bits CLEAR: If all masked bits of the Input Value is clear, the result will be “True”. NOT bits CLEAR: If all masked bits of the Input Value is clear, the result will be “False”.

		thresholds: Input value must be; equal or greater than “True if > =” value for result “True”. equal or lower than “False < =” value fo result “False. NOT thresholds: Input value must be; equal or greater than “True if > =” value for result “False”. equal or lower than “False < =” value fo result “True”.
Initial State	**False** / True	This parameter is used to select initial value of related input when device energized(or reset).
State after KNX bus recovery	**Initial** / Last	This parameter is used to select the related input state after bus voltage recovery.

4.6.3. Outputs

4.6.3.1. OUT1…15

Parameter	Setting	Description
Name	25 chracters are allowed. (Optional)	Any name can be defined for each Output. Name will be shown in ETS Parameters and Group Objects page.
Register	checked/ **unchecked**	This function is used to set the chosen output as Input Operand. Result of relevant output can be used as input for another Output.
OPERANDS		
IN1…IN15	checked/ **unchecked**	This parameter is used to select Logic Input(s) which needs for reletad Output operation.
STATE	checked/ **unchecked**	This parameter defines the value of result. It can be used as operand in Output operation.
FUNCTION		
Description	80 chracters are allowed. (Optional)	Any name can be defined for description of function. Description will **not** shown anywhere.
Data Type	**1 bit** / 1 byte	Output operation data type can be selected individually.
Operation	**Passthrough (unary)** NOT (unary) AND NAND OR NOR XOR XNOR Sum is 1 NOT Sum is 1 Sum is 0 or 1 NOT Sum is 0 or 1 All 0's or All 1's NOT All 0's or All 1's	Passthrough: It should be used with single operand only. Result will be the same as related operand value. NOT: It should be used with single operand only. Result will be reverted according to related operand value. AND: Selected Inputs will be multiplied consecutively and result value will be sent after. NAND: Selected Inputs will be multiplied consecutively and result value will be sent as inverted after. OR: Selected Inputs will be summed consecutively and result value will be sent after. NOR: Selected Inputs will be summed consecutively and result value will be sent as inverted after. XOR: Selected inputs will be summed according to EX-OR gate and result value will be sent after. XNOR: Selected inputs will be summed according to EX-OR gate and result value will be sent as inverted after. Sum is 1: If the one of the Input is "True" and rest of all is "False" the result will be "True". If multiple inputs are "True" or all "False", then result will be "False". NOT Sum is 1: If the one of the Input is "True" and rest of all is "False" the result will be "False". If multiple inputs are "True" or all "False", then result will be "True". Sum is 1 or 0: If the one of the input is "True" and rest of all are "False" or all inputs are "False", the result will be "True". If 2 or more inputs are "True", the

Parameter	Setting	result will be “False”. NOT Sum is 1 or 0: If the one of the input is “True” and rest of all are “False” or all inputs are “False”, the result will be “False”. If 2 or more inputs are “True”, the result will be “True”. Description
Operation (continues..)	continues…	All 0’s or All 1’s: If all inputs are “False” or “True”, the result will be “True”. NOT All 0’s or All 1’s: If all inputs are “False” or “True”, the result will be “False”.
Trigger	**operand update** operand update with blocking condition operand update with set/reset STATE input select	operand update: Output will be processed If any operand value changed. operand update with blocking condition: Output won’t be processed regardless to operand change, if blocking operand is active. operand update with set/reset STATE: This function should be used with STATE operand. This function allows to change the output state according to selected Input or Registered Output(if exist) value. input select: Output will be processed if the selected Input or Registered Output(if exist) has trigger value.
Sending blocked when	**IN1** … 15 or REG OUT 1…15	This function is used to block the output sending If selected Input or Registered Output has its selected value.
Send pending telegram after unblocking	**unchecked**/checked	This function is used to send output state after unblocking.
Send value when expression is	False True **True or False**	This function is used to send the output result if the Output expression value is as selected.
False Value (1 bit) True Value (1 bit)	**0** / 1 0 / **1**	
False Value (1 Byte) True Value (1 Byte)	**0**…255 0…**1**…255	
Send only on change	**unchecked**/checked	This function is used select the type of output sending.
Send initial state after KNX bus recovery	**unchecked**/checked	This function is used to send initial state of related output after KNX bus recovery.
Initial state	**False** / True	This parameter is used to select initial value of related output when device energized(or reset).
State after KNX bus recovery	**Initial** / Last	This parameter is used to select the related output state after KNX bus recovery.
Timer	**none** delayed sending periodical sending state hold timeout	delayed sending: This parameter is used to determine delay for output sending. periodical sending: This parameter is used to send the output state cyclically. state hold timeout: This parameter allows to keep the state in case of state changes.