



Application Descriptions

7

Terminal Unit Functional Blocks

13

Energy Demand Transformer Functional Blocks

2

Summary:

This document is part of the HVAC Application Interworking Standard for HVAC applications. This Chapter describes the Terminal Unit Energy Demand Transformer Functional Blocks.

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Document updates

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001.19-20	---	Stepwise completion
001.21	2002.04.19	Document completed and ready for TFI presentation
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2.4.00	2010.11.24	• VDTTU: added Parameters TempSupplyAirSetpMin and TempSupplyAirSetpMax.
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02.04.02	2013.10.29	Editorial updates for the publication of KNX Specifications 2.1.

References

- [01] Chapter 3/7/2 "Datapoint Types"
- [02] Chapter 7/10/1 "HVAC Sensor Functional Blocks"
- [03] Chapter 7/10/2 "HVAC HMI Functional Blocks"
- [04] Chapter 7/10/3 "HVAC Actuator Functional Blocks"
- [05] Chapter 7/10/4 "HVAC Common Functional Blocks"
- [06] Chapter 7/10/5 "HVAC Scheduler Functional Blocks"
- [07] Part 7/11 "Hot Water Heating - Introduction"
- [08] Part 7/12 "Direct Electric Heating"
- [09] Part 7/13 "Terminal Unit Functional Blocks"
- [10] Chapter 7/13/1 "Terminal Unit Controller"
- [11] Part 7/14 "Ventilation & Air Conditioning and Cold Water"
- [12] Part 10/1 "Logical Tag Extended"

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1 Introduction

1.1 Scope

This document is part of the KNX HVAC Application Interworking Standard.

It contains the specification of the Terminal Unit Energy Demand Transformer Functional Blocks used for HVAC applications.

Other general purpose Functional Blocks used for HVAC applications such as 'HVAC Sensors' [02], 'HVAC HMI' [03], 'HVAC Actuators' [04], 'HVAC Common Functions' [05] and 'HVAC Schedulers' [06] are described in separate documents.

The Functional Blocks of the 'TU Controllers' [10] are described in a separate document.

Functional Block specification for the applications 'Hot Water Heating' (HWH) [07], 'Direct Electric Heating' (DEH) [08] and 'Ventilation & Air Conditioning' (VAC) [11] are described in separate documents.

1.2 Objectives

This document includes the information necessary to build interoperable HVAC products using the KNX system. Runtime process interworking between HVAC control devices at the application level is the focus. Also data-interfaces for parameter setting, visualisation etc. are specified where appropriate (only state of the art datapoints generally used in all companies).

In addition, this document specifies the specific mechanisms for zoning and runtime process data distribution used in HVAC for an 'easy installation' system (LTE-HEE Mode [12]).

This is a technical specification with informative material provided as needed to convey key concepts. The approach taken here is a top-down view of interoperability. The HVAC system model is based on the decomposition of the distributed HVAC application by means of Functional Blocks, i.e. black-box description of Functional Blocks including data-interface and relationship to other Functional Blocks.

Every Functional Block may be part of a complex device (e.g. a heating controller) containing more than one Functional Block. Because of this modular approach, apart of some examples, there is no attempt in this specification to describe or dictate the internal construction of a Functional Block or to describe specific device types.

This document only includes details of the transport protocol as needed to specify interoperability and easy installation mechanisms. The document does not specifically cover implementation aspects, but guidelines are included where appropriate.

This part of the KNX HVAC specification is mainly but not completely independent of the underlying protocol since specific mechanisms for "easy configuration" and runtime data distribution must be available on the network.

Completely protocol dependent parts of the HVAC Specification such as data encoding and datapoint-types, object address tables, group address tables etc. are not part of this document.

1.3 Dependence on Configuration Modes

The main focus of this document is the specification of the **Basic Functional Blocks** and the **LTE specific parts**.

The document provides all necessary information needed:

- for a complete implementation of the Functional Blocks in LTE mode
- for the implementation of mandatory objects used for runtime interworking in standard mode (Basic Functional Block)

1.3.1 Runtime Interworking

Mode dependent (S, LT-R, LT-S, Ctrl, PB, A) implementation of optional runtime interworking objects is not specified in this document, e.g. “easy channel” definitions.

The following table (example) shows the mode dependencies concerning runtime interworking

			STANDARD MODE	EXTENDED MODE	
		Basic FB	S-Mode	Standard Mode Interface	LTE-MODE
Inputs	Inp1	NA	NA	NA	M
	Inp2	NA	NA	NA	O
	Inp3	(GO _b)		(GO)	O
Outputs	Outp1	NA	NA	NA	M
	- Outp1-1	GO _b	GO	GO	NA
	- Outp1-2	GO _b	GO	GO	NA
	Outp 2	GO _b	GO	GO	M

Inp1: is mandatory M in LTE Mode but the information is not available NA in the Basic FB and all other modes because the datapoint type (DPT) is today not available in standard mode and there are no products on the market with this functionality.

Inp2: is optional O in LTE Mode but the information is not available NA in the Basic FB and all other modes because the DPT is today not available in standard mode and there are no products on the market with this functionality.

Inp3: is optional O in LTE Mode and an optional Group Object in the Basic FB (GO_b). The datapoint is optionally supported as Group Object in the LTE Standard Mode Interface (GO). For all other modes the implementation is not defined. This is indicated by an empty field.

Outp1: is mandatory M in LTE Mode and has a structured DPT or a DPT with extended features which is today not available in standard mode. In the Basic FB the information of Outp1 is split up into Outp1-1 and Outp1-2 (separate datapoints with standard DPT). Outp1-1 and Outp1-2 are mandatory Group Objects GO in the Basic FB and are therefore mandatory in all modes.

Outp2: is mandatory in all modes.

1.3.2 Parameters and Diagnostic Data

LTE implementation:

- Parameters and Diagnostic Data of a Functional Block shall be implemented as Properties of the corresponding Interface Object which are accessed using individual addressing.
- These Properties are addressed via the standard Interface Object Type (IO Type) for this Functional Block. This IO Type is also used for datapoint addressing in the LTE runtime interworking model
- Standard DPT or HVAC specific DPT with extended features are used where appropriate.

Other modes:

- Parameters and Diagnostic Data can in principle be implemented as memory mapped datapoints or Group Objects or Properties of an Interface Object using individual addressing. This document does not lay down how to implement Parameters and Diagnostic Data in S, LT-R, LT-S, Ctrl, PB and A-Mode.
- In case of **Memory Mapped** datapoints the DPT may be manufacturer specific
- In case of **Group Objects** standard DPT shall be used instead of HVAC specific (extended) DPT. The description of these Group Objects shall be part of the mode-dependent specification (e.g. Channel definition).
- In case of **Properties**, the implementation of HVAC specific DPT with extended features may be a problem (depending on the available microcontroller resources). The manufacturer has the choice:
 - ⇒ to use the LTE style Property implementation as specified in this document (with the DPT and IO Type for LTE implementations) $\text{IO Type}^{\text{used}} = \text{IO Type}^{\text{HVAC-LTE}}$
 - ⇒ to implement these Properties using standard DPT only.
In this case, the same Property ID but a different IO Type shall be used since the DPT of a Property shall be unambiguous for each IO Type.
Simple IOT mapping rule: $\text{IO Type}^{\text{used}} = \text{IO Type}^{\text{standardDPT}} = \text{IO Type}^{\text{HVAC-LTE}} + 10000$
(e.g. $\text{BUC}^{\text{HVAC-LTE}} = 128 \Rightarrow \text{BUC}^{\text{standardDPT}} = 10128$)
 - ⇒ It is allowed to implement in a device both Interface Object Types $\text{IO Type}^{\text{HVAC-LTE}}$ and $\text{IO Type}^{\text{standardDPT}}$. The implementation of parameters and diagnostic data of one given Functional Block shall however be complete. It is thus not allowed to implement part of the datapoints of a Functional Block in $\text{IO Type}^{\text{standardDPT}}$ and the remaining in $\text{IO Type}^{\text{HVAC-LTE}}$.

Implementation of Parameter and Diagnostic Data				
	Property based		Group Object	Memory mapped
	LTE style	Standard DPT		
IO Type	$\text{IO Type}^{\text{HVAC-LTE}}$ e.g. BUC=128	$\text{IO Type}^{\text{HVAC-LTE}} + 10000$ e.g. BUC=10128		
Property ID	Property ID x	Property ID x		
DPT	if standard DPT	=> same standard DPT	=> same standard DPT	company specific
	if HVAC-LTE specific*) e.g. 205.100	=> mapped standard DPT, e.g. 9.001	=> mapped standard DPT, e.g. 9.001	

 In this document only the **HVAC-LTE style** of Parameters and Diagnostic Data is specified for $\text{IO Type}^{\text{HVAC-LTE}}$.

In the FB datapoint overview those Parameters and Diagnostic Data with HVAC-LTE specific (extended) DPT are marked “*”) ”

The mapping of HVAC specific DPT to standard DPT is generic and described in the document [01] – HVAC Datapoint Types

1.4 Glossary

This glossary only contains a few positions, which might be misunderstood.

Term	Description
Supervisor	Supervisor stands for building management station, programme unit or similar installations, which normally are computer based.
xx	
xx	

1.5 Abbreviations

Functional Blocks:

Sensors [02], HMI [03], Actuators [04], Common Controller Functions [05]

Abbreviation	[Doc]	Description
OTS	1	Outside Temperature Sensor

Terminal Units (TU) [09]

as far as relevant in this document

Abbreviation	Description
ACDTTU	Air Cooler Energy Demand Transformer Terminal Unit
AHDTTU	Air Heater Energy Demand Transformer Terminal Unit
CCDTTU	Chilled Ceiling Energy Demand Transformer Terminal Unit
FCC	Fan Coil Unit Controller
RCCTU	Radiator and Chilled Ceiling Room Control
RHDTTU	Radiator Heating Energy Demand Transformer Terminal Unit
RRCTU	Radiator Room Control TU
SPUC	Split Unit Control
VAVCEA	Variable Air Volume Control Extract Air
VAVCSA	Variable Air Volume Control Supply Air
VDDTU	Ventilation Demand Transformer Terminal Unit
WHPC	Water Heat Pump Control

General

Abbreviation	Description
cs	Company Specific
GO	Group Object mandatory
(GO)	Group Object optional
M	Mandatory
NA	Not Allowed / Not Applicable
O	Optional
S	Has to be implemented in Standard Mode, if implemented in LTE-HEE Mode
HEE	HVAC Easy Extension
HVAC	Heating Ventilation Air Conditioning
LTE	Logical Tag Extended
IR	LTE-Service InfoReport
W	LTE-Service Write

2 Formal matters

2.1 Introduction to Functional Blocks

The Functional Blocks are described in a standard way as described below.

Every Functional Block may be part of a complex device (e.g. a controller) containing more than one Functional Block.

A Functional Block never can be split. Although not all inputs, outputs etc. are mandatory. The optional inputs, outputs do not have to be realised.

2.2 Description of Functional Blocks

2.2.1 Aims and objectives

This clause shall give an overview of the functionality of the Functional Block, as well as eventually information about interworking with other Functional Blocks.

2.2.2 Functional specification

This chapter gives detailed information about the Inputs, the Outputs, the Parameters, the Diagnostic Data, the Alarms and the Hardwired I/O's.

2.2.3 Constraints

Constraints for the use of the Functional Block as well as for the use of Inputs, Outputs, Parameters, Diagnostic Data, Alarms etc. are described here.

2.2.4 Functional Block

On top of the Functional Block the name and its abbreviation is marked.

Then the Inputs / Outputs are following.

The Inputs / Outputs are grouped in Binding Groups, according to LTE (Logical Tag Extended).

Mandatory Inputs / Outputs have a grey arrow with the letter M.

They also have to be available in the System Mode.

Optional Inputs / Outputs have a white arrow.

Some of these Inputs / Outputs, in case of being implemented, also have to be available in the System Mode. These Inputs / Outputs have a white arrow with the letter S.

Some of the Inputs / Outputs only make sense in combination, others may be used either / or.

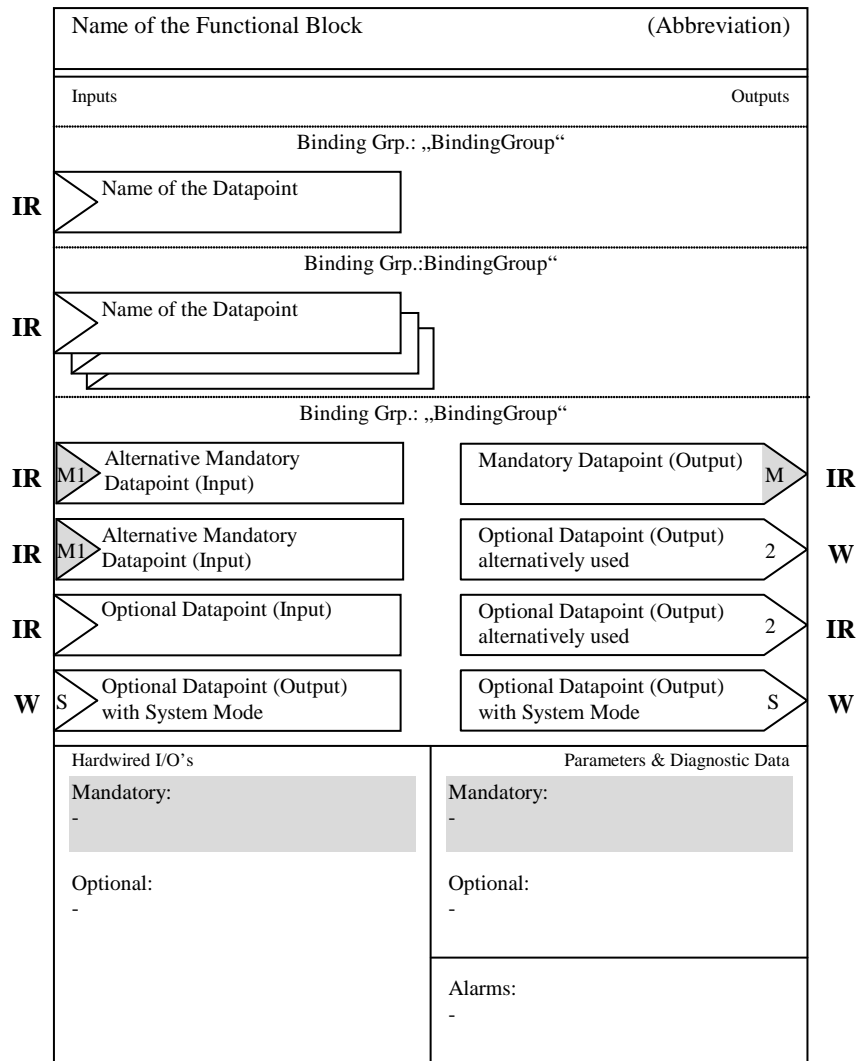
Such Inputs / Outputs are grouped with numbers.

At the bottom there are three fields:

On the left-hand side we find the Hardwired Inputs / Outputs, the mandatory ones in a grey field, the optional ones in a white field.

On the right-hand side there is a field for the Parameters and the Diagnostic Data used in the Functional Block (mandatory in grey, optional in white).

On the right-hand side at the bottom there is the field for the Alarms, generated in the Functional Block (for use in the Functional Block Alarm Source).



2.2.5 Datapoints / Formats

Datapoints	Description / Remarks	Datapoint Type	Additional Information
Inputs			
Name of the Data-Point	Descriptions, remarks if necessary	Name of the Datapoint Type and/or coding LTE: DPT_TempHVACAbs_Z V ₁₆ Z ₈ S: DPT_Value_Temp F ₁₆	
			M = mandatory, with system mode M1/M2 = alternative mandatory O = optional, system mode optional S = optional, but if implemented, then with system mode 1,2 the numbers represent alternative packages
			Unit of the Datapoint Value Default Value
			Range indications
Outputs			
Name of the Data-Point	see above	see above	see above
Parameters			
Name of the Parameter	see above	see above	see above
Diagnostic Data			
Name of the Diagnostic Data	see above	see above	see above

Alarm	Description / Remarks	Error		Additional Information
		Code	Prio	
Name of the Alarm	Descriptions, remarks if necessary	Code of the Alarm	Priority of the Alarm	Additional Information

Detailed specification of the Datapoints

Detailed description of the Datapoints is given in a separate document [01].

Notations:

Symbol	Field
A	Character
A _[n]	Character String with Length n
B	Boolean / Bit set
C	Control
E	Exponent
F	Float (with ME)
M	Mantisse
N	eNumeration
S	Sign
U	Unsigned value
V	2's Complement signed value
Z ₈	Standardised Status/Command B ₈

Example:

<u>Format:</u>	3 octet; V ₁₆ Z ₈ <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">3 MSB Temperature VVVVVVVV</div> <div style="text-align: center;">2 LSB Temperature VVVVVVVV</div> <div style="text-align: center;">1 Standard Status/Comm. ZZZZZZZZ</div> </div> <div style="display: flex; justify-content: space-around; align-items: center; margin-top: 10px;"> <div>V₁₆</div> <div>Z₈</div> </div>
<u>Encoding:</u>	See below

Octets are transmitted from left to right, i.e. octet 1 is transmitted last.

Standard Status/Command Information

Some of the Datapoints are combined with Standard Status/Command Information.
For further information see [01].

3 Terminal Unit Energy Demand Transformer Functional Blocks

3.1 Introduction to TU Energy Demand Transformer Functional Blocks

This document contains the Terminal Unit Energy Demand Transformer Functional Blocks.

It is possible to combine more than one Functional Block in a device.

3.2 Radiator Heating Energy Demand Transformer TU (RHDTTU)

3.2.1 Aims and objectives

The Functional Block 'Radiator Heating Energy Demand Transformer TU' transforms the heating energy demand information out of the terminal units (e.g. radiator control or floor heating control) into a flow water temperature value.

In plants with floor heating and radiator heating this Functional Block may be applied twice (with different max temperatures and different distribution segments)

There are corresponding Functional Blocks for chilled ceiling cooling and for air re-heater / cooler and for ventilation.

3.2.2 Functional specification

To transform the energy demand values to a flow temperature there are different possibilities:
e.g.

- demand % to °C by means of a curve
- demand (yes/no) plus a heating curve (based on outside temperature)
- a combination of the above
- demand (yes/no) to a fix temperature

Detailed realisation is manufacturer specific.

(see also 3.7 'Collection and Processing of Demand Information in LTE-HEE)

Inputs

- | | |
|---------------------------------|---|
| • TempOutside | This information contains the outside temperature, delivered from another device with this functionality. |
| • EnergyDemRD
(n times) | This information is delivered by the TU controllers which need hot water. (100 % = full heating)
The LTE information is completed with an attribute containing information from the ContrMode. |
| • ValueEnergyDemRD
(n times) | This information is delivered by the TU controllers which need hot water. (100 % = full heating)
(only in S-Mode separate, see EnergyDemRD) |
| • ContrModeAct
(n-times) | The controlling mode delivered by the TU controllers.
(only in S-Mode separate, see EnergyDemRD) |

Outputs

- | | |
|--------------------------|--|
| • TempFlowWaterDemRHDTTU | This value represents the demanded flow water temperature for heating plus attributes. |
|--------------------------|--|

Binding Groups (LTE)

The Functional Block shows 2 different binding groups.

- DistrSegmH_a This binding group defines the distribution segment heating.
- OutsideSensorZone_o This binding group defines the outside sensor zone, from which the outside temperature will be taken.

Parameters

- cs

Diagnostic Data

- ValueEnergyDemAct This value represents a theoretical average value of the input demands. The calculation is company specific.

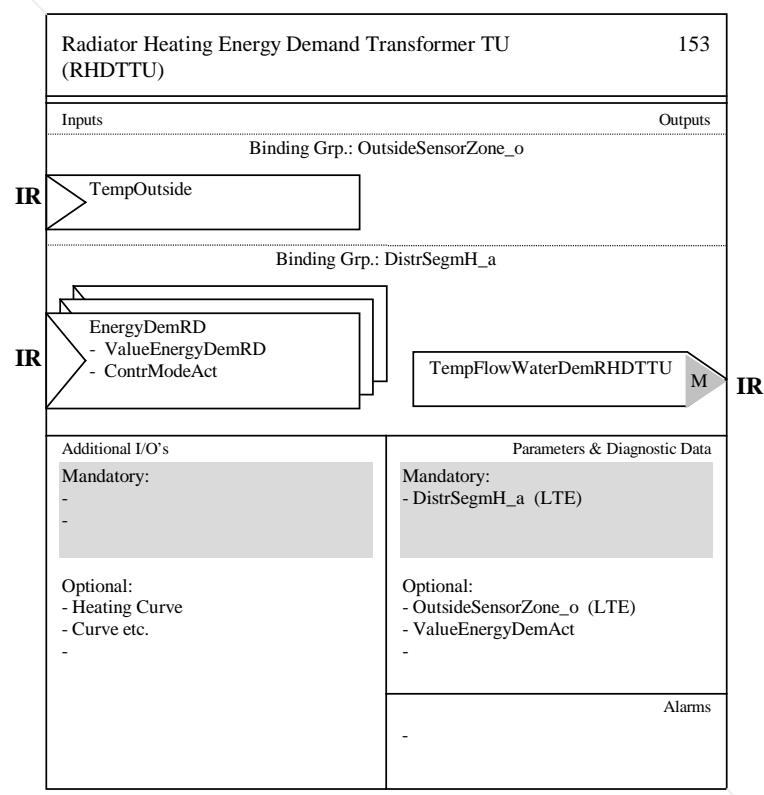
Alarms

- cs

3.2.3 Constraints

None.

3.2.4 Functional Block Diagram



3.2.5 Datapoint description

Overview

Datapoints	Description / Remarks	Datapoint Type	Additional Info
Inputs			
Temp Outside	Outside temperature actual value with: - COV and RepPer - Z ₈ STATUS supported from FB 'Outside Temperature Sensor'	LTE: 205.100 DPT_TempHVACAbs_Z V ₁₆ Z ₈ S: 9.001 DPT_Value_Temp F ₁₆	LTE: O S: (GO) °C
n times			
Energy Dem RD	Energy demand value for Heat Flow Demand manager (water) (100 % = full heating) plus ContrMode with: - COV and RepPer from FB various TU controller	LTE:211.100 DPT_EnergyDemWater U ₈ N ₈ S: NA	LTE: M S: NA 0% ... 100 % plus Attribute
Value Energy Dem RD	Energy demand value for Heat Flow Demand manager (water) (100 % = full heating) with: - COV and RepPer from FB various TU controller	LTE: NA S: 5.004 DPT_Percent_U8 U ₈	LTE: NA S: (GO) 0% ... 100 %
Contr Mode Act	Active Controlling Mode with: - COV and RepPer from FB various TU controller	LTE: NA S: 20.105 DPT_HVACContrMode N ₈	LTE: NA S: (GO) enum.
Outputs			
Temp Flow Water Dem RHDTTU	Demanded flow water temperature with: - COV and RepPer to FB 'Heat Flow Demand Manager'	LTE: 210.100 DPT_TempFlowWaterDemAbs V ₁₆ B ₁₆ S: NA	LTE: M S: NA °C plus attributes
Parameter			
Distr SegmH_a	LTE zoning number for Distribution Segment Heating	202.002 DPT_UcountValue8_Z U ₈ Z ₈	M 1
Outside Sensor Zone_o	LTE zoning number for Outside Sensor Zone	202.002 DPT_UcountValue8_Z U ₈ Z ₈	O 1
Diagnostic Data			
Value Energy Dem Act	Theoretical, calculated value for the energy demand	5.004 DPT_Percent_U8 U ₈ ¹⁾	O 0% ... 100 %

¹⁾ Implementation of Properties using standard DPT see chapter 1.3.2

RHDTTU Runtime Interworking - Dependence on Configuration Modes

			STANDARD MODE	EXTENDED MODE	
		Basic FB	S-Mode	Standard Mode Interface	LTE-MODE
Inputs	TempOutside	(GO _b)		(GO)	O
	EnergyDemRD ¹⁾	NA _b	NA	NA	M
	ValueEnergyDemRD ²⁾	(GO _b)		(GO)	NA
	ContrModeAct ²⁾	(GO _b)		(GO)	NA
Outputs	TempFlowWaterDemRHDTTU	NA _b	NA	NA	M

¹⁾ combined information not available in S-Mode (see also ²⁾)

²⁾ single information of 1) (only in S-Mode available, see also ¹⁾)

RHDTTU LTE specific Properties

		Support
Parameter	DistrSegmH_a	M
	OutsideSensorZone_o	O

RHDTTU Standard Properties of Interface Objects (or memory mapped DP)

		Support
Parameter	---	
DiagnosticData	ValueEnergyDemAct	O

3.2.6 Detailed specification of the Datapoints

3.2.6.1 Input TempOutside

Standard Mode

DP Name:	TempOutside	Abbr.:	---	Mandatory	<input type="checkbox"/>
FB Name:	RHDTTU			Can be internal	<input type="checkbox"/>
Description					
This information is provided by the Functional Block 'Outside Temperature Sensor'.					
Datapoint Type					
DPT_Name:	DPT_Value_Temp				
DPT Format:	F ₁₆	DPT_ID:	9.001		
Field	Description	Supp.	Range	Unit	Default
		O	full	°C	cs
Access Type					
◆ Input					
	N → this	<input type="checkbox"/>	1 → this	<input checked="" type="checkbox"/>	
	Spontaneous	<input checked="" type="checkbox"/>	Cyclically:	<input checked="" type="checkbox"/>	Time-out: 31 min (rec.)
	Request	<input type="checkbox"/>	Polling:	<input type="checkbox"/>	Period:
Communication Type					
◆ Group Object Datapoint					Mandatory: <input checked="" type="checkbox"/>
	Default Group Address:	---			
Dynamics					
	Power down:	Save:	<input type="checkbox"/>		
	Power up:	Value:	No initialisation:	<input type="checkbox"/>	Default value:
		Saved value:	<input type="checkbox"/>		<input type="checkbox"/>
			<input type="checkbox"/>	Read from bus:	<input type="checkbox"/>
Exception Handling					

Special Features					

LTE-HEE Mode

FB:	RHDTTU	LTE Client	TempOutside		Mandatory <input type="checkbox"/>	
		Input Name:			Optional <input checked="" type="checkbox"/>	
Description:						
This information is provided by the Functional Block 'Outside Temperature Sensor' and includes the STATUS of the information.						
DPT:	Name	DPT_TempHVACAbs_Z	DPT ID	205.100	Datatype format	V ₁₆ Z ₈
Field	Description			Sup.	Unit	Default
Temperature	Outside temperature value			M	°C.	cs
STATUS	Bitset			M		
- OutOfService	Sensor out of service			M	t/f	false
- Fault	Sensor value is corrupted			O	t/f	false
- Overridden	Sensor is temporarily overridden			O	t/f	false
- InAlarm	Sensor is in alarm			O	t/f	false
- AlarmUnAck	Acknowledgement of alarm			O	t/f	false
Communication:						
Binding Group:						
Class	Type			Default		
Geographical <input type="checkbox"/>						
Application Specific <input checked="" type="checkbox"/>	OutsideSensorZone			1		
Unassigned <input type="checkbox"/>	Broadcast <input type="checkbox"/>	Configurable <input type="checkbox"/>				
DP Address:	IO Type(ID):		320 (OTS)	Property ID:	51	
LTE-Service (event):	InfoReport Sniffer on Binding Group:			--		
InfoReport <input checked="" type="checkbox"/>	Timeout:			31 Min		
LTE-Service (polling):	Read Wildcard / Resp Sniffer on Binding Group:			--		
Read – Response <input type="checkbox"/>						
Value after Power-up:	Default Value <input checked="" type="checkbox"/>			Stored Value <input type="checkbox"/>		
Exception Handling:				Save at Powerdown <input type="checkbox"/>		

Special Features:						

3.2.6.2 Input EnergyDemRD**Standard Mode**

Not applicable.

LTE-HEE Mode

FB:	RHDTTU	LTE Client	EnergyDemRD		Mandatory <input checked="" type="checkbox"/>	
		Input Name:			Optional <input type="checkbox"/>	
Description:						
This input is provided by the TU controllers and contains the value for the energy demand.						
DPT:	Name	DPT_EnergyDemWater	DPT ID	211.100	Datatype format	U ₈ N ₈
Field	Description				Sup.	Unit
Value	Energy demand value				M	%
Mode	0 = Auto 1 = Heat 2 = MrningWarmup 3 = Cool 4 = Night Purge 5 = Precool 6 = Off 7 = Test 8 = EmergHeat 9 = Fan only 10 = Free Cool 11 = Ice 20 = NoDem other enums.				M M O O O O O O O NA	enum. 0
Communication:						
Binding Group:						
Class	Type		Default			
Geographical	<input type="checkbox"/>					
Application Specific	<input checked="" type="checkbox"/> DistrSegmH		1			
Unassigned	<input type="checkbox"/> Broadcast <input type="checkbox"/> Configurable <input type="checkbox"/>					
DP Address:	IO Type(ID):		256 (RRCTU) 257 (RCCRC) 261 (VAVCSA)		Property ID:	71
LTE-Service (event):	InfoReport Sniffer on Binding Group: --					
InfoReport <input checked="" type="checkbox"/>	Timeout: 31 Min					
LTE-Service (polling):	Read Wildcard / Resp Sniffer on Binding Group: --					
Read – Response <input type="checkbox"/>						
Value after Power-up:		Default Value <input checked="" type="checkbox"/>			Stored Value <input type="checkbox"/>	
Exception Handling:					Save at Powerdown <input type="checkbox"/>	

Special Features:						

3.2.6.3 Input ValueEnergyDemRD**LTE-HEE Mode**

Not applicable.

Standard Mode

DP Name:	ValueEnergyDemRD	Abbr.:	---	Mandatory	<input type="checkbox"/>
FB Name:	RHDTTU			Can be internal	<input type="checkbox"/>
Description					
This Information is provided by the TU controllers and contains the value for the energy demand.					
Datapoint Type					
DPT_Name:	DPT_Percent_U8				
DPT Format:	U ₈	DPT_ID:	5.004		
Field	Description	Supp.	Range	Unit	Default
		M	full	%	cs
Access Type					
◆ Input					
N → this	<input checked="" type="checkbox"/>	1 → this	<input type="checkbox"/>		
Spontaneous	<input checked="" type="checkbox"/>	Cyclically:	<input checked="" type="checkbox"/>	Time-out:	31 min (rec.)
Request	<input type="checkbox"/>	Polling:	<input type="checkbox"/>	Period:	
Communication Type					
◆ Group Object Datapoint				Mandatory:	<input checked="" type="checkbox"/>
Default Group Address:		---			
Dynamics					
Power down:	Save:	<input type="checkbox"/>			
Power up:	Value:	No initialisation:	<input type="checkbox"/>	Default value:	<input checked="" type="checkbox"/>
		Saved value:	<input type="checkbox"/>		<input type="checkbox"/>
			<input type="checkbox"/>	Read from bus:	<input type="checkbox"/>
Exception Handling					

Special Features					

3.2.6.4 Input ContrModeAct**LTE-HEE Mode NA:****Standard Mode**

DP Name:	ContrModeAct	Abbr.:	---	Mandatory	<input type="checkbox"/>
FB Name:	RHDTTU			Can be internal	<input type="checkbox"/>
Description					
This Information is provided by the TU controllers and contains the active ContrMode.					
Datapoint Type					
DPT_Name:	DPT_HVACContrMode				
DPT Format:	N ₈	DPT_ID:	20.105		
Field	Description	Supp.	Range	Unit	Default
	0 = Auto	M			0
	1 = Heat	O			
	2 = MrningWarmup	O			
	3 = Cool	O			
	4 = Night Purge	O			
	5 = Precool	O			
	6 = Off	O			
	7 = Test	O			
	8 = EmergHeat	O			
	9 = Fan only	O			
	10 = Free Cool	O			
	11 = Ice	O			
	20 = NoDem	O			
	other enums.	NA			
Access Type					
◆ Input					
	N → this	<input checked="" type="checkbox"/>	1 → this	<input type="checkbox"/>	
	Spontaneous	<input checked="" type="checkbox"/>	Cyclically:	<input checked="" type="checkbox"/>	Time-out: 31 min (rec.)
	Request	<input type="checkbox"/>	Polling:	<input type="checkbox"/>	Period:
Communication Type					
◆ Group Object Datapoint					Mandatory: <input checked="" type="checkbox"/>
	Default Group Address:	---			
Dynamics					
	Power down:	Save:	<input type="checkbox"/>		
	Power up:	Value:	No initialisation:	<input type="checkbox"/>	Default value:
		Saved value:	<input type="checkbox"/>		<input type="checkbox"/>
			<input type="checkbox"/>	Read from bus:	<input type="checkbox"/>
Exception Handling					

Special Features					

3.2.6.5 Output TempFlowWaterDemRHDTTU

Standard Mode

Not applicable.

LTE-HEE Mode

FB:	RHDTTU	LTE Server	TempFlowWaterDemRHDTTU				Mandatory <input checked="" type="checkbox"/>	
		Output Name:					Optional <input type="checkbox"/>	
Description:								
This output contains the setpoint value for the flow water temperature controller.								
DPT:	Name	DPT_TempFlowWaterDemAbs	DPT ID	210.100	Datatype format	V ₁₆ B ₁₆		
Field	Description		Sup.	Range	Unit	COV	Default	
Temperature	Temperature setpoint value for flow water		M	full	°C	2	cs	
Attributes	Bit			Bitset B ₁₆				
- DemValid	0	Validity of FlowTempDem	M	true/false	bool	Y	false	
- AbsLoadPrio	1	Absolute load priority	O	true/false	bool	Y	false	
- ShiftLoadPrio	2	Shift load priority	O	true/false	bool	Y	false	
- MaxTempLimit	3	TempFlowDem with max limit	O	true/false	bool	Y	false	
- MinTempLimit	4	TempFlowDem with min limit	O	true/false	bool	Y	false	
- DHWReq	5	Demand from DHW, for DHW only	NA	false	bool	---	false	
- RoomCtrlReq	6	Demand from room control	O	true/false	bool	Y	true	
- VentReq	7	Demand from ventilation	NA	false	bool	---	false	
- AuxAllSeasonR	8	Demand from auxiliary consum.	O	true/false	bool	Y	false	
- SystPumpReq	9	Request for water circulation	O	true/false	bool	Y	false	
- EmergDem	10	resulting emergency heat demand for frost protection for DHW only	O	true/false	bool	Y	false	
- DHWLegioReq	11		NA	false	bool	---	false	
- reserved	12-15		NA			---	false	
Communication:								
Binding Group:								
Class		Type			Default			
Geographical <input type="checkbox"/>								
Application Specific <input checked="" type="checkbox"/>		DistrSegmH			1			
Unassigned <input type="checkbox"/>		Broadcast <input type="checkbox"/> Configurable <input type="checkbox"/>						
DP Address:		IO Type(ID): 153 (RHDTTU)		Property ID: 51				
LTE-Services (event):		COV <input checked="" type="checkbox"/> MinRepTime: 10 sec		Heartbeat: 15 min				
InfoReport <input checked="" type="checkbox"/>		Output per default communicating <input type="checkbox"/>		Binding Group Wildcard allowed <input type="checkbox"/>				
		Tx Prio: High <input type="checkbox"/> Normal <input checked="" type="checkbox"/> Low <input type="checkbox"/>						
(LTE Read-Response polling of the output shall always be supported)		Transm after Power-up: Stored Value <input type="checkbox"/> Act Value <input checked="" type="checkbox"/> Default Value <input type="checkbox"/>						
Property-Service (individual access):		Read only <input type="checkbox"/> Read/Write <input checked="" type="checkbox"/>						
Exception Handling:					Save at Powerdown <input type="checkbox"/>			

Special Features:								

3.2.6.6 Parameter DistrSegmH

FB:	RHDTTU	Property Name (Server):	DistrSegmH				Mandatory <input checked="" type="checkbox"/>	
Optional <input type="checkbox"/>								
Description:								
Number of the heating distribution segment.								
DPT:	Name	DPT_UcountValue8_Z	DPT ID	202.002	Datatype format	U ₈ Z ₈		
Field	Description			Sup.	Range	Unit	Default	
Zone	Number of the Heating Segment			M	(0) 1...31		1	
STATUS								
- OutofService	zone active / inactive			O	true/false	Bitset	false	
- all other bits	not supported, fixed to '0'			NA		bool	false	
COMMAND								
- NormalWrite				M	enum		cs	
- SetOSV & ResetOSV	Set zone inactive / active			O				
- all other commands	not supported			NA				
Communication:								
DP Address:		IO Type(ID):		153 (RHDTTU)	Property ID:		101	
(in the server)		Start-Index:		1	N° of elements		1	
Property access:		Read only <input type="checkbox"/>		Read/Write <input checked="" type="checkbox"/>				
Protection		Read level		-	Write level		-	
Exception Handling: Value after Power-up: Stored Value <input checked="" type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input type="checkbox"/>								

Special Features:								
The device is not LTE communicating in this zone if zone is 'OutOfService'.								

3.2.6.7 Parameter OutsideSensorZone

FB:	RHDTTU	Property Name (Server):	OutsideSensorZone				Mandatory <input type="checkbox"/>	
Optional <input checked="" type="checkbox"/>								
Description:								
Number of the outside sensor zone.								
DPT:	Name	DPT_UcountValue8_Z	DPT ID	202.002	Datatype format	U ₈ Z ₈		
Field	Description			Sup.	Range	Unit	Default	
Zone	Number of the Outside Sensor Zone			M	(0) 1...31		1	
STATUS								
- OutofService	zone active / inactive			O	true/false	Bitset	false	
- all other bits	not supported, fixed to '0'			NA		bool	false	
COMMAND								
- NormalWrite				M	enum		cs	
- SetOSV & ResetOSV	Set zone inactive / active			O				
- all other commands	not supported			NA				
Communication:								
DP Address:		IO Type(ID):		153 (RHDTTU)	Property ID:		102	
(in the server)		Start-Index:		1	N° of elements		1	
Property access:		Read only <input type="checkbox"/>		Read/Write <input checked="" type="checkbox"/>				
Protection		Read level		-	Write level		-	
Exception Handling: Value after Power-up: Stored Value <input checked="" type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input type="checkbox"/>								

Special Features:								
The device is not LTE communicating in this zone if zone is 'OutOfService'.								

3.2.6.8 Diagnostic Data ValueEnergyDemAct

FB:	RHDTTU	Property Name (Server):	ValueEnergyDemAct				Mandatory <input type="checkbox"/>	
							Optional <input checked="" type="checkbox"/>	
Description:								
Calculated value of energy demand.								
DPT:	Name	DPT_Percent_U8	DPT ID	5.004	Datatype format	U ₈		
Field	Description				Sup.	Range	Unit	Default
Value	Calculated energy demand value				M	full	%	cs
Communication:								
DP Address:		IO Type(ID):		153 (RHDTTU)	Property ID:		111	
(in the server)		Start-Index:		1	N° of elements		1	
Property access:		Read only <input checked="" type="checkbox"/>		Read/Write <input type="checkbox"/>				
Protection		Read level		-	Write level		-	
Exception Handling: Value after Power-up: Stored Value <input checked="" type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input type="checkbox"/>								

Special Features:								

3.3 Chilled Ceiling Energy Demand Transformer TU (CCDTTU)

3.3.1 Aims and objectives

The Functional Block 'Chilled Ceiling Energy Demand Transformer TU' transforms the cooling energy demand information out of the terminal units (e.g. chilled ceiling control) into a flow water temperature value.

There are corresponding Functional Blocks for radiator heating and for air re-heater / cooler and for ventilation.

3.3.2 Functional specification

To transform the energy demand values to a flow temperature there are different possibilities:
e.g.

- demand % to °C by means of a curve
- demand (yes/no) plus a cooling curve (based on outside temperature)
- a combination of the above
- demand (yes/no) to a fix temperature

Detailed realisation is manufacturer specific.

Inputs

- | | |
|---------------------------------|--|
| • TempOutside | This information contains the outside temperature, delivered from another device with this functionality. |
| • EnergyDemCC
(n times) | This information is delivered by the TU controllers which need cold water. (100 % = full cooling)
The LTE information is completed with an attribute containing information from the ContrMode. |
| • ValueEnergyDemCC
(n times) | This information is delivered by the TU controllers which need cold water. (100 % = full cooling)
(only in S-Mode separate, see EnergyDemCC) |
| • ContrModeAct
(n-times) | The controlling mode delivered by the TU controllers.
(only in S-Mode separate, see EnergyDemCC) |

Outputs

- | | |
|--------------------------|--|
| • TempFlowWaterDemCCDTTU | This value represents the demanded flow water temperature for cooling plus attributes. |
|--------------------------|--|

Binding Groups (LTE)

The Functional Block shows 2 different binding groups.

- | | |
|-----------------------|---|
| • DistrSegmC_b | This binding group defines the distribution segment cooling. |
| • OutsideSensorZone_o | This binding group defines the outside sensor zone, from which the outside temperature will be taken. |

Parameters

- cs

Diagnostic Data

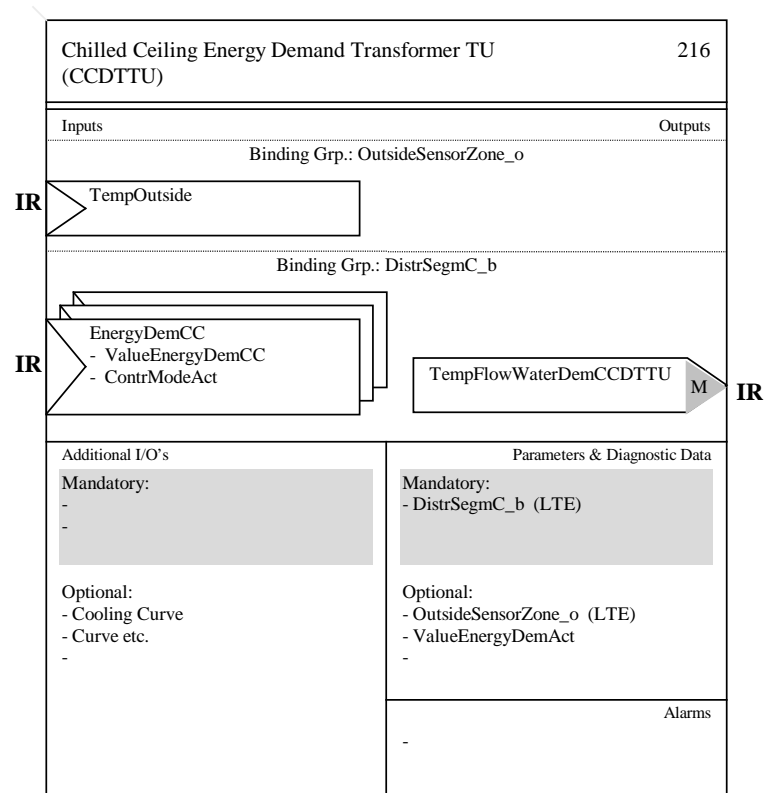
- ValueEnergyDemAct This value represents a theoretical average value of the input demands. The calculation is company specific.

Alarms

- cs

3.3.3 Constraints

None.

3.3.4 Functional Block Diagram

3.3.5 Datapoint description

Overview

Datapoints	Description / Remarks	Datapoint Type	Additional Info
Inputs			
Temp Outside	Outside temperature actual value with: - COV and RepPer - Z ₈ STATUS supported from FB 'Outside Temperature Sensor'	LTE: 205.100 DPT_TempHVACAbs_Z V ₁₆ Z ₈ S: 9.001 DPT_Value_Temp F ₁₆	LTE: O S: (GO) °C
n times			
Energy Dem CC	Energy demand value for Cold Flow Demand manager (water) (100 % = full cooling) plus ContrMode with: - COV and RepPer from FB various TU controller	LTE: 211.100 DPT_EnergyDemWater U ₈ N ₈ S: NA	LTE: M S: NA 0% ... 100 % plus Attribute
Value Energy Dem CC	Energy demand value for Cold Flow Demand manager (water) (100 % = full cooling) with: - COV and RepPer from FB various TU controller	LTE: NA S: 5.004 DPT_Percent_U8 U ₈	LTE: NA S: (GO) 0% ... 100 %
Contr Mode Act	Active Controlling Mode with: - COV and RepPer from FB various TU controller	LTE: NA S: 20.105 DPT_HVACContrMode N ₈	LTE: NA S: (GO) enum.
Outputs			
Temp Flow Water Dem CCDTTU	Value for demanded flow water temperature with: - COV and RepPer to FB 'Cold Flow Demand Manager'	LTE: 210.100 DPT_TempFlowWaterDemAbs V ₁₆ B ₁₆ S: NA	LTE: M S: NA °C plus attributes
Parameter			
Distr SegmC_b	LTE zoning number for Distribution Segment Heating	202.002 DPT_UcountValue8_Z U ₈ Z ₈	M 1
Outside Sensor Zone_o	LTE zoning number for Outside Sensor Zone	202.002 DPT_UcountValue8_Z U ₈ Z ₈	O 1
Diagnostic Data			
Value Energy Dem Act	Theoretical, calculated value for the energy demand	5.004 DPT_Percent_U8 U ₈ ¹⁾	O 0% ... 100 %

¹⁾ Implementation of Properties using standard DPT see chapter 1.3.2

CCDTTU Runtime Interworking - Dependence on Configuration Modes

			STANDARD MODE	EXTENDED MODE	
		Basic FB	S-Mode	Standard Mode Interface	LTE-MODE
Inputs	TempOutside	(GO _b)		(GO)	O
	EnergyDemCC	NA _b	NA	NA	M
	ValueEnergyDemCC	(GO _b)		(GO)	NA
	ContrModeAct	(GO _b)		(GO)	NA
Outputs	TempFlowWaterDemCCDTTU	NA _b	NA	NA	M

¹⁾ combined information not available in S-Mode (see also ²⁾)

²⁾ single information of 1) (only in S-Mode available, see also ¹⁾)

CCDTTU LTE specific Properties

		Support
Parameter	DistrSegmC_b	M
	OutsideSensorZone_o	O

CCDTTU Standard Properties of Interface Objects (or memory mapped DP)

		Support
Parameter	---	
DiagnosticData	ValueEnergyDemAct	O

3.3.6 Detailed specification of the Datapoints

3.3.6.1 Input TempOutside

Standard Mode

DP Name:	TempOutside	Abbr.:	---	Mandatory	<input type="checkbox"/>
FB Name:	CCDTTU			Can be internal	<input type="checkbox"/>
Description					
This information is provided by the Functional Block 'Outside Temperature Sensor'.					
Datapoint Type					
DPT_Name:	DPT_Value_Temp				
DPT Format:	F ₁₆	DPT_ID:	9.001		
Field	Description	Supp.	Range	Unit	Default
		O	full	°C	cs
Access Type					
◆ Input					
	N → this	<input type="checkbox"/>	1 → this	<input checked="" type="checkbox"/>	
	Spontaneous	<input checked="" type="checkbox"/>	Cyclically:	<input checked="" type="checkbox"/>	Time-out: 31 min (rec.)
	Request	<input type="checkbox"/>	Polling:	<input type="checkbox"/>	Period:
Communication Type					
◆ Group Object Datapoint					
Mandatory: <input checked="" type="checkbox"/>					
Default Group Address: ---					
Dynamics					
	Power down:	Save:	<input type="checkbox"/>		
	Power up:	Value:	No initialisation:	<input type="checkbox"/>	Default value:
		Saved value:	<input type="checkbox"/>		<input type="checkbox"/>
			<input type="checkbox"/>	Read from bus:	<input type="checkbox"/>
Exception Handling					

Special Features					

LTE-HEE Mode

FB:	CCDTTU	LTE Client	TempOutside		Mandatory <input type="checkbox"/>	
		Input Name:			Optional <input checked="" type="checkbox"/>	
Description:						
This information is provided by the Functional Block 'Outside Temperature Sensor' and includes the STATUS of the information.						
DPT:	Name	DPT_TempHVACAbs_Z	DPT ID	205.100	Datatype format	V ₁₆ Z ₈
Field	Description			Sup.	Unit	Default
Temperature	Outside temperature value			M	°C.	cs
STATUS	Bitset			M		
- OutOfService	Sensor out of service			M	t/f	false
- Fault	Sensor value is corrupted			O	t/f	false
- Overridden	Sensor is temporarily overridden			O	t/f	false
- InAlarm	Sensor is in alarm			O	t/f	false
- AlarmUnAck	Acknowledgement of alarm			O	t/f	false
Communication:						
Binding Group:						
Class	Type			Default		
Geographical <input type="checkbox"/>						
Application Specific <input checked="" type="checkbox"/>	OutsideSensorZone			1		
Unassigned <input type="checkbox"/>	Broadcast <input type="checkbox"/>	Configurable <input type="checkbox"/>				
DP Address:	IO Type(ID):		320 (OTS)	Property ID:	51	
LTE-Service (event):	InfoReport Sniffer on Binding Group:			--		
InfoReport <input checked="" type="checkbox"/>	Timeout:			31 Min		
LTE-Service (polling):	Read Wildcard / Resp Sniffer on Binding Group:			--		
Read – Response <input type="checkbox"/>						
Value after Power-up:	Default Value <input checked="" type="checkbox"/>			Stored Value <input type="checkbox"/>		
Exception Handling:				Save at Powerdown <input type="checkbox"/>		

Special Features:						

3.3.6.2 Input EnergyDemCC**Standard Mode**

Not applicable.

LTE-HEE Mode

FB:	CCDTTU	LTE Client	EnergyDemCC		Mandatory <input checked="" type="checkbox"/>	
		Input Name:			Optional <input type="checkbox"/>	
Description:						
This input is provided by the TU controllers and contains the value for the energy demand.						
DPT:	Name	DPT_EnergyDemWater	DPT ID	211.100	Datatype format	U ₈ N ₈
Field	Description				Sup.	Unit
Value	Energy demand value				M	%
Mode	0 = Auto 1 = Heat 2 = MrningWarmup 3 = Cool 4 = Night Purge 5 = Precool 6 = Off 7 = Test 8 = EmergHeat 9 = Fan only 10 = Free Cool 11 = Ice 20 = NoDem other enums.				M M O O O O O O O NA	enum. 0
Communication:						
Binding Group:						
Class	Type		Default			
Geographical <input type="checkbox"/>						
Application Specific <input checked="" type="checkbox"/>	DistrSegmC		1			
Unassigned <input type="checkbox"/>	Broadcast <input type="checkbox"/> Configurable <input type="checkbox"/>					
DP Address:	IO Type(ID):		257 (RCCRC) 261 (VAVCSA)	Property ID:	72	
LTE-Service (event):	InfoReport Sniffer on Binding Group: --					
InfoReport <input checked="" type="checkbox"/>	Timeout: 31 Min					
LTE-Service (polling):	Read Wildcard / Resp Sniffer on Binding Group: --					
Read – Response <input type="checkbox"/>						
Value after Power-up:	Default Value <input checked="" type="checkbox"/>				Stored Value <input type="checkbox"/>	
Exception Handling:						Save at Powerdown <input type="checkbox"/>

Special Features:						

3.3.6.3 Input ValueEnergyDemCC**LTE-HEE Mode**

Not applicable.

Standard Mode

DP Name:	ValueEnergyDemCC	Abbr.:	---	Mandatory	<input type="checkbox"/>
FB Name:	CCDTTU	Can be internal			<input type="checkbox"/>
Description					
This Information is provided by the TU controllers and contains the value for the energy demand.					
Datapoint Type					
DPT_Name:	DPT_Percent_U8				
DPT Format:	U ₈	DPT_ID:	5.004		
Field	Description	Supp.	Range	Unit	Default
		M	full	%	cs
Access Type					
◆ Input					
N → this	<input checked="" type="checkbox"/>	1 → this	<input type="checkbox"/>		
Spontaneous	<input checked="" type="checkbox"/>	Cyclically:	<input checked="" type="checkbox"/>	Time-out:	31 min (rec.)
Request	<input type="checkbox"/>	Polling:	<input type="checkbox"/>	Period:	
Communication Type					
◆ Group Object Datapoint				Mandatory:	<input checked="" type="checkbox"/>
Default Group Address:		---			
Dynamics					
Power down:	Save:	<input type="checkbox"/>			
Power up:	Value:	No initialisation:	<input type="checkbox"/>	Default value:	<input checked="" type="checkbox"/>
		Saved value:	<input type="checkbox"/>		<input type="checkbox"/>
			<input type="checkbox"/>	Read from bus:	<input type="checkbox"/>
Exception Handling					

Special Features					

3.3.6.4 Input ContrModeAct**LTE-HEE Mode**

Not applicable.

Standard Mode

DP Name:	ContrModeAct	Abbr.:	---	Mandatory	<input type="checkbox"/>
FB Name:	CCDTTU			Can be internal	<input type="checkbox"/>
Description					
This Information is provided by the TU controllers and contains the active ContrMode.					
Datapoint Type					
DPT_Name:	DPT_HVACContrMode				
DPT Format:	N ₈	DPT_ID:	20.105		
Field	Description	Supp.	Range	Unit	Default
	0 = Auto	M			0
	1 = Heat	O			
	2 = MrningWarmup	O			
	3 = Cool	O			
	4 = Night Purge	O			
	5 = Precool	O			
	6 = Off	O			
	7 = Test	O			
	8 = EmergHeat	O			
	9 = Fan only	O			
	10 = Free Cool	O			
	11 = Ice	O			
	20 = NoDem	O			
	other enums.	NA			
Access Type					
◆ Input					
	N → this	<input checked="" type="checkbox"/>	1 → this	<input type="checkbox"/>	
	Spontaneous	<input checked="" type="checkbox"/>	Cyclically:	<input checked="" type="checkbox"/>	Time-out: 31 min (rec.)
	Request	<input type="checkbox"/>	Polling:	<input type="checkbox"/>	Period:
Communication Type					
◆ Group Object Datapoint					Mandatory: <input checked="" type="checkbox"/>
	Default Group Address:	---			
Dynamics					
	Power down:	Save:	<input type="checkbox"/>		
	Power up:	Value:	No initialisation:	<input type="checkbox"/>	Default value:
			Saved value:	<input type="checkbox"/>	<input checked="" type="checkbox"/>
				<input type="checkbox"/>	Read from bus:
				<input type="checkbox"/>	<input type="checkbox"/>
Exception Handling					

Special Features					

3.3.6.5 Output TempFlowWaterDemCCDTTU

Standard Mode

Not applicable.

LTE-HEE Mode

FB:	CCDTTU	LTE Server	TempFlowWaterDemCCDTTU				Mandatory <input checked="" type="checkbox"/>	
		Output Name:					Optional <input type="checkbox"/>	
Description:								
This output contains the setpoint value for the flow water temperature controller.								
DPT:	Name	DPT_TempFlowWaterDemAbs	DPT ID	210.100	Datatype format	V ₁₆ B ₁₆		
Field	Description		Sup.	Range	Unit	COV	Default	
Temperature	Temperature setpoint value for flow water		M	full	°C	0.5	cs	
Attributes	Bit			Bitset B ₁₆				
- DemValid	0	Validity of FlowTempDem	M	true/false	bool	Y	false	
- AbsLoadPrio	1	Absolute load priority	O	true/false	bool	Y	false	
- ShiftLoadPrio	2	Shift load priority	O	true/false	bool	Y	false	
- MaxTempLimit	3	TempFlowDem with max limit	O	true/false	bool	Y	false	
- MinTempLimit	4	TempFlowDem with min limit	O	true/false	bool	Y	false	
- DHWRequest	5	Demand from DHW, for DHW only	NA	false	bool	---	false	
- RoomCtrlReq	6	Demand from room control	O	true/false	bool	Y	true	
- VentReq	7	Demand from ventilation	NA	false	bool	---	false	
- AuxAllSeasonR	8	Demand from auxiliary consum.	O	true/false	bool	Y	false	
- SystPumpReq	9	Request for water circulation	O	true/false	bool	Y	false	
- EmergDem	10	resulting emergency heat demand for frost protection for DHW only	O	true/false	bool	Y	false	
- DHWLegioReq	11		NA	false	bool	---	false	
- reserved	12-15		NA			---	false	
Communication:								
Binding Group:								
Class		Type			Default			
Geographical <input type="checkbox"/>								
Application Specific <input checked="" type="checkbox"/>		DistrSegmC			1			
Unassigned <input type="checkbox"/>		Broadcast <input type="checkbox"/> Configurable <input type="checkbox"/>						
DP Address:		IO Type(ID): 216 (CCDTTU)		Property ID: 51				
LTE-Services (event):		COV <input checked="" type="checkbox"/> MinRepTime: 10 sec		Heartbeat: 15 min				
InfoReport <input checked="" type="checkbox"/>		Output per default communicating <input type="checkbox"/>		Binding Group Wildcard allowed <input type="checkbox"/>				
		Tx Prio: High <input type="checkbox"/> Normal <input checked="" type="checkbox"/> Low <input type="checkbox"/>						
(LTE Read-Response polling of the output shall always be supported)		Transm after Power-up: Stored Value <input type="checkbox"/> Act Value <input checked="" type="checkbox"/> Default Value <input type="checkbox"/>						
Property-Service (individual access):		Read only <input type="checkbox"/> Read/Write <input checked="" type="checkbox"/>						
Exception Handling:						Save at Powerdown <input type="checkbox"/>		

Special Features:								

3.3.6.6 Parameter DistrSegmC

FB: CCDTTU	Property Name (Server): DistrSegmC		Mandatory <input checked="" type="checkbox"/> Optional <input type="checkbox"/>	
Description:				
Number of the cooling distribution segment.				
DPT:	Name	DPT_UcountValue8_Z	DPT ID	202.002
Datatype format		U ₈ Z ₈		
Field	Description	Sup.	Range	Unit
Zone	Number of the Cooling Segment	M	(0) 1...31	1
STATUS				
- OutofService	zone active / inactive	O	true/false	Bitset
- all other bits	not supported, fixed to '0'	NA		bool
COMMAND				
- NormalWrite		M	enum	cs
- SetOSV & ResetOSV	Set zone inactive / active	O		
- all other commands	not supported	NA		
Communication:				
DP Address:	IO Type(ID):	216 (CCDTTU)	Property ID:	101
(in the server)	Start-Index:	1	N° of elements	1
Property access:	Read only <input type="checkbox"/>	Read/Write <input checked="" type="checkbox"/>		
Protection	Read level	-	Write level	-
Exception Handling: Value after Power-up: Stored Value <input checked="" type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input type="checkbox"/>				

Special Features:				
The device is not LTE communicating in this zone if zone is 'OutOfService'.				

3.3.6.7 Parameter OutsideSensorZone

FB: CCDTTU	Property Name (Server): OutsideSensorZone		Mandatory <input type="checkbox"/> Optional <input checked="" type="checkbox"/>	
Description:				
Number of the outside sensor zone.				
DPT:	Name	DPT_UcountValue8_Z	DPT ID	202.002
Datatype format		U ₈ Z ₈		
Field	Description	Sup.	Range	Unit
Zone	Number of the Outside Sensor Zone	M	(0) 1...31	1
STATUS				
- OutofService	zone active / inactive	O	true/false	Bitset
- all other bits	not supported, fixed to '0'	NA		bool
COMMAND				
- NormalWrite		M	enum	cs
- SetOSV & ResetOSV	Set zone inactive / active	O		
- all other commands	not supported	NA		
Communication:				
DP Address:	IO Type(ID):	216 (CCDTTU)	Property ID:	102
(in the server)	Start-Index:	1	N° of elements	1
Property access:	Read only <input type="checkbox"/>	Read/Write <input checked="" type="checkbox"/>		
Protection	Read level	-	Write level	-
Exception Handling: Value after Power-up: Stored Value <input checked="" type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input type="checkbox"/>				

Special Features:				
The device is not LTE communicating in this zone if zone is 'OutOfService'.				

3.3.6.8 Diagnostic Data ValueEnergyDemAct

FB:	CCDTTU	Property Name (Server):				ValueEnergyDemAct		Mandatory <input type="checkbox"/>	
								Optional <input checked="" type="checkbox"/>	
Description:									
Calculated value of energy demand.									
DPT:	Name	DPT_Percent_U8	DPT ID	5.004	Datatype format		U ₈		
Field	Description				Sup.	Range	Unit	Default	
Value	Calculated energy demand value				M	full	%	cs	
Communication:									
DP Address:		IO Type(ID):		216 (CCDTTU)		Property ID:		111	
(in the server)		Start-Index:		1		N° of elements		1	
Property access:		Read only <input checked="" type="checkbox"/>		Read/Write <input type="checkbox"/>					
Protection		Read level		-		Write level		-	
Exception Handling: Value after Power-up: Stored Value <input checked="" type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input type="checkbox"/>									

Special Features:									

3.4 Air Heater Energy Demand Transformer TU (AHD TTU)

3.4.1 Aims and objectives

The Functional Block ‘Air Heater Energy Demand Transformer TU’ transforms the heating energy demand information out of the terminal units (e.g. re-heater of VAV control) into a flow water temperature value.

There are corresponding Functional Blocks for radiator heating, chilled ceiling cooling and for air re-cooler and for ventilation.

3.4.2 Functional specification

To transform the energy demand values to a flow temperature there are different possibilities: e.g.

- demand % to °C by means of a curve
- demand (yes/no) plus a heating curve (based on outside temperature)
- a combination of the above
- demand (yes/no) to a fix temperature

Detailed realisation is manufacturer specific.

Inputs

- | | |
|---------------------------------|---|
| • TempOutside | This information contains the outside temperature, delivered from another device with this functionality. |
| • EnergyDemAH
(n times) | This information is delivered by the TU controllers which need hot water. (100 % = full heating)
The LTE information is completed with an attribute containing information from the ContrMode. |
| • ValueEnergyDemAH
(n times) | This information is delivered by the TU controllers which need hot water. (100 % = full heating)
(only in S-Mode separate, see EnergyDemAH) |
| • ContrModeAct
(n-times) | The controlling mode delivered by the TU controllers.
(only in S-Mode separate, see EnergyDemAH) |

Outputs

- | | |
|---------------------------|--|
| • TempFlowWaterDemAHD TTU | This value represents the demanded flow water temperature for heating plus attributes. |
|---------------------------|--|

Binding Groups (LTE)

The Functional Block shows 2 different binding groups.

- | | |
|-----------------------|---|
| • DistrSegmH_c | This binding group defines the distribution segment heating. |
| • OutsideSensorZone_o | This binding group defines the outside sensor zone, from which the outside temperature will be taken. |

Parameters

- cs

Diagnostic Data

- ValueEnergyDemAct

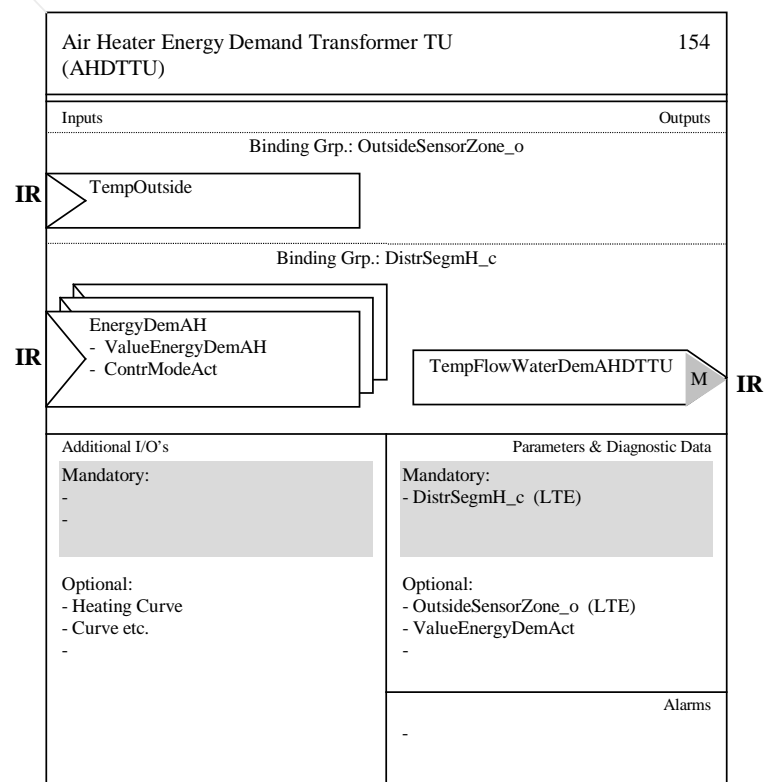
This value represents a theoretical average value of the input demands. The calculation is company specific.

Alarms

- cs

3.4.3 Constraints

None.

3.4.4 Functional Block Diagram

3.4.5 Datapoint description

Overview

Datapoints	Description / Remarks	Datapoint Type	Additional Info
Inputs			
Temp Outside	Outside temperature actual value with: - COV and RepPer - Z ₈ STATUS supported from FB 'Outside Temperature Sensor'	LTE: 205.100 DPT_TempHVACAbs_Z V ₁₆ Z ₈ S: 9.001 DPT_Value_Temp F ₁₆	LTE: O S: (GO) °C
n times			
Energy Dem AH	Energy demand value for Heat Flow Demand manager (water) (100 % = full heating) plus ContrMode with: - COV and RepPer from FB various TU controller	LTE: 211.100 DPT_EnergyDemWater U ₈ N ₈ S: NA	LTE: M S: NA 0% ... 100 % plus Attribute
Value Energy Dem AH	Energy demand value for Heat Flow Demand manager (water) (100 % = full heating) with: - COV and RepPer from FB various TU controller	LTE: NA S: 5.004 DPT_Percent_U8 U ₈	LTE: NA S: (GO) 0% ... 100 %
Contr Mode Act	Active Controlling Mode with: - COV and RepPer from FB various TU controller	LTE: NA S: 20.105 DPT_HVACContrMode N ₈	LTE: NA S: (GO) enum.
Outputs			
Temp Flow Water Dem AHDTTU	Demanded flow water temperature with: - COV and RepPer to FB 'Heat Flow Demand Manager'	LTE: 210.100 DPT_TempFlowWaterDemAbs V ₁₆ B ₁₆ S: NA	LTE: M S: NA °C plus attributes
Parameter			
Distr SegmH_c	LTE zoning number for Distribution Segment Heating	202.002 DPT_UcountValue8_Z U ₈ Z ₈	M 1
Outside Sensor Zone_o	LTE zoning number for Outside Sensor Zone	202.002 DPT_UcountValue8_Z U ₈ Z ₈	O 1
Diagnostic Data			
Value Energy Dem Act	Theoretical, calculated value for the energy demand	5.004 DPT_Percent_U8 U ₈ 1)	O 0% ... 100 %

1) Implementation of Properties using standard DPT see chapter 1.3.2

AHDTTU Runtime Interworking - Dependence on Configuration Modes

			STANDARD MODE	EXTENDED MODE		
			Basic FB	S-Mode	Standard Mode Interface	LTE-MODE
Inputs	TempOutside	(GO _b)		(GO)	O	
	EnergyDemAH ¹⁾	NA _b	NA	NA	M	
	ValueEnergyDemAH ²⁾	(GO _b)		(GO)	NA	
	ContrModeAct ²⁾	(GO _b)		(GO)	NA	
Outputs	TempFlowWaterDemAHDTTU	NA _b	NA	NA	M	

¹⁾ combined information not available in S-Mode (see also ²⁾)

²⁾ single information of 1) (only in S-Mode available, see also ¹⁾)

AHDTTU LTE specific Properties

		Support
Parameter	DistrSegmH_c	M
	OutsideSensorZone_o	O

AHDTTU Standard Properties of Interface Objects (or memory mapped DP)

		Support
Parameter	---	
DiagnosticData	ValueEnergyDemAct	O

3.4.6 Detailed specification of the Datapoints

3.4.6.1 Input TempOutside

Standard Mode

DP Name:	TempOutside	Abbr.:	---	Mandatory	<input type="checkbox"/>
FB Name:	AHDTTU			Can be internal	<input type="checkbox"/>
Description					
This information is provided by the Functional Block 'Outside Temperature Sensor'.					
Datapoint Type					
DPT_Name:	DPT_Value_Temp				
DPT Format:	F ₁₆	DPT_ID:	9.001		
Field	Description	Supp.	Range	Unit	Default
		O	full	°C	cs
Access Type					
◆ Input					
	N → this	<input type="checkbox"/>	1 → this	<input checked="" type="checkbox"/>	
	Spontaneous	<input checked="" type="checkbox"/>	Cyclically:	<input checked="" type="checkbox"/>	Time-out: 31 min (rec.)
	Request	<input type="checkbox"/>	Polling:	<input type="checkbox"/>	Period:
Communication Type					
◆ Group Object Datapoint					Mandatory: <input checked="" type="checkbox"/>
	Default Group Address:	---			
Dynamics					
	Power down:	Save:	<input type="checkbox"/>		
	Power up:	Value:	No initialisation:	<input type="checkbox"/>	Default value:
		Saved value:	<input type="checkbox"/>		<input type="checkbox"/>
			<input type="checkbox"/>	Read from bus:	<input type="checkbox"/>
Exception Handling					

Special Features					

LTE-HEE Mode

FB:	AHDTTU	LTE Client	TempOutside			Mandatory <input type="checkbox"/>
		Input Name:				Optional <input checked="" type="checkbox"/>
Description:						
This information is provided by the Functional Block 'Outside Temperature Sensor' and includes the STATUS of the information.						
DPT:	Name	DPT_TempHVACAbs_Z	DPT ID	205.100	Datatype format	V ₁₆ Z ₈
Field	Description			Sup.	Unit	Default
Temperature	Outside temperature value			M	°C.	cs
STATUS	Bitset			M		
- OutOfService	Sensor out of service			M	t/f	false
- Fault	Sensor value is corrupted			O	t/f	false
- Overridden	Sensor is temporarily overridden			O	t/f	false
- InAlarm	Sensor is in alarm			O	t/f	false
- AlarmUnAck	Acknowledgement of alarm			O	t/f	false
Communication:						
Binding Group:						
Class	Type			Default		
Geographical <input type="checkbox"/>						
Application Specific <input checked="" type="checkbox"/>	OutsideSensorZone			1		
Unassigned <input type="checkbox"/>	Broadcast <input type="checkbox"/>	Configurable <input type="checkbox"/>				
DP Address:	IO Type(ID):		320 (OTS)	Property ID:	51	
LTE-Service (event):	InfoReport Sniffer on Binding Group:			--		
InfoReport <input checked="" type="checkbox"/>	Timeout:			31 Min		
LTE-Service (polling):	Read Wildcard / Resp Sniffer on Binding Group:			--		
Read – Response <input type="checkbox"/>						
Value after Power-up:	Default Value <input checked="" type="checkbox"/>			Stored Value <input type="checkbox"/>		
Exception Handling:				Save at Powerdown <input type="checkbox"/>		

Special Features:						

3.4.6.2 Input EnergyDemAH**Standard Mode**

Not applicable.

LTE-HEE Mode

FB:	AHDTTU	LTE Client	EnergyDemAH				Mandatory <input checked="" type="checkbox"/>	
		Input Name:					Optional <input type="checkbox"/>	
Description:								
This input is provided by the TU controllers and contains the value for the energy demand.								
DPT:	Name	DPT_EnergyDemWater	DPT ID	211.100	Datatype format	U ₈ N ₈		
Field	Description				Sup.	Unit	Default	
Value	Energy demand value				M	%	cs	
Mode	0 = Auto 1 = Heat 2 = MrningWarmup 3 = Cool 4 = Night Purge 5 = Precool 6 = Off 7 = Test 8 = EmergHeat 9 = Fan only 10 = Free Cool 11 = Ice 20 = NoDem other enums.				M M O O O O O O O NA	enum.	0	
Communication:								
Binding Group:								
Class		Type			Default			
Geographical <input type="checkbox"/>								
Application Specific <input checked="" type="checkbox"/>		DistrSegmH			1			
Unassigned <input type="checkbox"/>		Broadcast <input type="checkbox"/> Configurable <input type="checkbox"/>						
DP Address:		258 (FCC) 259 (WHPC) 260 (SPUC) 261 (VAVCSA)			Property ID:		73	
LTE-Service (event):		InfoReport Sniffer on Binding Group: --						
InfoReport <input checked="" type="checkbox"/>		Timeout: 31 Min						
LTE-Service (polling):		Read Wildcard / Resp Sniffer on Binding Group: --						
Read – Response <input type="checkbox"/>								
Value after Power-up:				Default Value <input checked="" type="checkbox"/>			Stored Value <input type="checkbox"/>	
Exception Handling:						Save at Powerdown <input type="checkbox"/>		

Special Features:								

3.4.6.3 Input ValueEnergyDemAH**LTE-HEE Mode**

Not applicable.

Standard Mode

DP Name:	ValueEnergyDemAH	Abbr.:	---	Mandatory	<input type="checkbox"/>
FB Name:	AHDTTU			Can be internal	<input type="checkbox"/>
Description					
This Information is provided by the TU controllers and contains the value for the energy demand.					
Datapoint Type					
DPT_Name:	DPT_Percent_U8				
DPT Format:	U ₈	DPT_ID:	5.004		
Field	Description	Supp.	Range	Unit	Default
		M	full	%	cs
Access Type					
◆ Input					
N → this	<input checked="" type="checkbox"/>	1 → this	<input type="checkbox"/>		
Spontaneous	<input checked="" type="checkbox"/>	Cyclically:	<input checked="" type="checkbox"/>	Time-out:	31 min (rec.)
Request	<input type="checkbox"/>	Polling:	<input type="checkbox"/>	Period:	
Communication Type					
◆ Group Object Datapoint				Mandatory:	<input checked="" type="checkbox"/>
Default Group Address:		---			
Dynamics					
Power down:	Save:	<input type="checkbox"/>			
Power up:	Value:	No initialisation:	<input type="checkbox"/>	Default value:	<input checked="" type="checkbox"/>
		Saved value:	<input type="checkbox"/>		<input type="checkbox"/>
			<input type="checkbox"/>	Read from bus:	<input type="checkbox"/>
Exception Handling					

Special Features					

3.4.6.4 Input ContrModeAct**LTE-HEE Mode NA:****Standard Mode**

DP Name:	ContrModeAct		Abbr.:	---		Mandatory	<input type="checkbox"/>
FB Name:	AHDTTU					Can be internal	<input type="checkbox"/>
Description							
This Information is provided by the TU controllers and contains the active ContrMode.							
Datapoint Type							
DPT_Name:	DPT_HVACContrMode						
DPT Format:	N ₈		DPT_ID:	20.105			
Field	Description		Supp.	Range	Unit	Default	
	0 = Auto		M			0	
	1 = Heat		O				
	2 = MrningWarmup		O				
	3 = Cool		O				
	4 = Night Purge		O				
	5 = Precool		O				
	6 = Off		O				
	7 = Test		O				
	8 = EmergHeat		O				
	9 = Fan only		O				
	10 = Free Cool		O				
	11 = Ice		O				
	20 = NoDem		O				
	other enums.		NA				
Access Type							
◆ Input							
	N → this	<input checked="" type="checkbox"/>	1 → this	<input type="checkbox"/>			
	Spontaneous	<input checked="" type="checkbox"/>	Cyclically:	<input checked="" type="checkbox"/>	Time-out:	31 min (rec.)	
	Request	<input type="checkbox"/>	Polling:	<input type="checkbox"/>	Period:		
Communication Type							
◆ Group Object Datapoint						Mandatory:	<input checked="" type="checkbox"/>
	Default Group Address:		---				
Dynamics							
	Power down:	Save:	<input type="checkbox"/>				
	Power up:	Value:	No initialisation:	<input type="checkbox"/>	Default value:	<input checked="" type="checkbox"/>	
		Saved value:	<input type="checkbox"/>		<input type="checkbox"/>		
			<input type="checkbox"/>	Read from bus:	<input type="checkbox"/>		
Exception Handling							

Special Features							

3.4.6.5 Output TempFlowWaterDemAHDTTU**Standard Mode**

Not applicable.

LTE-HEE Mode

FB:	AHDTTU	LTE Server	TempFlowWaterDemAHDTTU				Mandatory <input checked="" type="checkbox"/>	
		Output Name:					Optional <input type="checkbox"/>	
Description:								
This output contains the setpoint value for the flow water temperature controller.								
DPT:	Name	DPT_TempFlowWaterDemAbs	DPT ID	210.100	Datatype format	V ₁₆ B ₁₆		
Field	Description		Sup.	Range	Unit	COV	Default	
Temperature	Temperature setpoint value for flow water		M	full	°C	2	cs	
Attributes	Bit				Bitset B ₁₆			
- DemValid	0	Validity of FlowTempDem		M	true/false	bool	Y	false
- AbsLoadPrio	1	Absolute load priority		O	true/false	bool	Y	false
- ShiftLoadPrio	2	Shift load priority		O	true/false	bool	Y	false
- MaxTempLimit	3	TempFlowDem with max limit		O	true/false	bool	Y	false
- MinTempLimit	4	TempFlowDem with min limit		O	true/false	bool	Y	false
- DHWReq	5	Demand from DHW, for DHW only		NA	false	bool	---	false
- RoomCtrlReq	6	Demand from room control		O	true/false	bool	Y	true
- VentReq	7	Demand from ventilation		NA	false	bool	---	false
- AuxAllSeasonR	8	Demand from auxiliary consum.		O	true/false	bool	Y	false
- SystPumpReq	9	Request for water circulation		O	true/false	bool	Y	false
- EmergDem	10	resulting emergency heat demand for frost protection for DHW only		O	true/false	bool	Y	false
- DHWLegioReq	11			NA	false	bool	---	false
- reserved	12-15			NA			---	false
Communication:								
Binding Group:								
Class		Type				Default		
Geographical <input type="checkbox"/>								
Application Specific <input checked="" type="checkbox"/>		DistrSegmH				1		
Unassigned <input type="checkbox"/>		Broadcast <input type="checkbox"/>		Configurable <input type="checkbox"/>				
DP Address:		IO Type(ID):		154 (AHDTTU)		Property ID:		51
LTE-Services (event):		COV <input checked="" type="checkbox"/>		MinRepTime:		10 sec		Heartbeat: 15 min
InfoReport <input checked="" type="checkbox"/>		Output per default communicating <input type="checkbox"/>		Binding Group Wildcard allowed <input type="checkbox"/>				
		Tx Prio:		High <input type="checkbox"/>		Normal <input checked="" type="checkbox"/>		Low <input type="checkbox"/>
(LTE Read-Response polling of the output shall always be supported)		Transm after Power-up: Stored Value <input type="checkbox"/> Act Value <input checked="" type="checkbox"/> Default Value <input type="checkbox"/>						
Property-Service (individual access):		Read only <input type="checkbox"/>		Read/Write <input checked="" type="checkbox"/>				
Exception Handling:						Save at Powerdown <input type="checkbox"/>		

Special Features:								

3.4.6.6 Parameter DistrSegmH

FB:	AHDTTU	Property Name (Server):	DistrSegmH	Mandatory <input checked="" type="checkbox"/>		Optional <input type="checkbox"/>	
Description:							
Number of the heating distribution segment.							
DPT:	Name	DPT_UcountValue8_Z	DPT ID	202.002	Datatype format	U ₈ Z ₈	
Field	Description			Sup.	Range	Unit	Default
Zone	Number of the Heating Segment			M	(0) 1...31		1
STATUS						Bitset	
- OutofService	zone active / inactive			O	true/false		false
- all other bits	not supported, fixed to '0'			NA		bool	false
COMMAND					enum		cs
- NormalWrite				M			
- SetOSV & ResetOSV	Set zone inactive / active			O			
- all other commands	not supported			NA			
Communication:							
DP Address:		IO Type(ID):	154 (AHDTTU)	Property ID:		101	
(in the server)		Start-Index:	1	N° of elements		1	
Property access:		Read only <input type="checkbox"/>	Read/Write <input checked="" type="checkbox"/>				
Protection		Read level	-	Write level		-	
Exception Handling: Value after Power-up: Stored Value <input checked="" type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input type="checkbox"/>							

Special Features:							
The device is not LTE communicating in this zone if zone is 'OutOfService'.							

3.4.6.7 Parameter OutsideSensorZone

FB:	AHDTTU	Property Name (Server):	OutsideSensorZone	Mandatory <input type="checkbox"/>		Optional <input checked="" type="checkbox"/>	
Description:							
Number of the outside sensor zone.							
DPT:	Name	DPT_UcountValue8_Z	DPT ID	202.002	Datatype format	U ₈ Z ₈	
Field	Description			Sup.	Range	Unit	Default
Zone	Number of the Outside Sensor Zone			M	(0) 1...31		1
STATUS						Bitset	
- OutofService	zone active / inactive			O	true/false		false
- all other bits	not supported, fixed to '0'			NA		bool	false
COMMAND					enum		cs
- NormalWrite				M			
- SetOSV & ResetOSV	Set zone inactive / active			O			
- all other commands	not supported			NA			
Communication:							
DP Address:		IO Type(ID):	154 (AHDTTU)	Property ID:		102	
(in the server)		Start-Index:	1	N° of elements		1	
Property access:		Read only <input type="checkbox"/>	Read/Write <input checked="" type="checkbox"/>				
Protection		Read level	-	Write level		-	
Exception Handling: Value after Power-up: Stored Value <input checked="" type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input type="checkbox"/>							

Special Features:							
The device is not LTE communicating in this zone if zone is 'OutOfService'.							

3.4.6.8 Diagnostic Data ValueEnergyDemAct

FB:	AHDTTU	Property Name (Server):				ValueEnergyDemAct		Mandatory <input type="checkbox"/>	
								Optional <input checked="" type="checkbox"/>	
Description:									
Calculated value of energy demand.									
DPT:	Name	DPT_Percent_U8	DPT ID	5.004	Datatype format		U ₈		
Field	Description				Sup.	Range	Unit	Default	
Value	Calculated energy demand value				M	full	%	cs	
Communication:									
DP Address:		IO Type(ID):		154 (AHDTTU)		Property ID:		111	
(in the server)		Start-Index:		1		N° of elements		1	
Property access:		Read only <input checked="" type="checkbox"/>		Read/Write <input type="checkbox"/>					
Protection		Read level		-		Write level		-	
Exception Handling: Value after Power-up: Stored Value <input checked="" type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input type="checkbox"/>									

Special Features:									

3.5 Air Cooler Energy Demand Transformer TU (ACD TTU)

3.5.1 Aims and objectives

The Functional Block 'Air Cooler Energy Demand Transformer TU' transforms the cooling energy demand information out of the terminal units (e.g. re-cooler of a VAV control) into a flow water temperature value.

There are corresponding Functional Blocks for radiator heating, chilled ceiling cooling and for air re-heater and for ventilation.

3.5.2 Functional specification

To transform the energy demand values to a flow temperature there are different possibilities: e.g.

- demand % to °C by means of a curve
- demand (yes/no) plus a cooling curve (based on outside temperature)
- a combination of the above
- demand (yes/no) to a fix temperature

Detailed realisation is manufacturer specific.

Inputs

- | | |
|---------------------------------|--|
| • TempOutside | This information contains the outside temperature, delivered from another device with this functionality. |
| • EnergyDemAC
(n times) | This information is delivered by the TU controllers which need cold water. (100 % = full cooling)
The LTE information is completed with an attribute containing information from the ContrMode. |
| • ValueEnergyDemAC
(n times) | This information is delivered by the TU controllers which need cold water. (100 % = full cooling)
(only in S-Mode separate, see EnergyDemAC) |
| • ContrModeAct
(n-times) | The controlling mode delivered by the TU controllers.
(only in S-Mode separate, see EnergyDemAC) |

Outputs

- | | |
|---------------------------|--|
| • TempFlowWaterDemACD TTU | This value represents the demanded flow water temperature for cooling plus attributes. |
|---------------------------|--|

Binding Groups (LTE)

The Functional Block shows 2 different binding groups.

- | | |
|-----------------------|---|
| • DistrSegmC_d | This binding group defines the distribution segment cooling. |
| • OutsideSensorZone_o | This binding group defines the outside sensor zone, from which the outside temperature will be taken. |

Parameters

- CS

Diagnostic Data

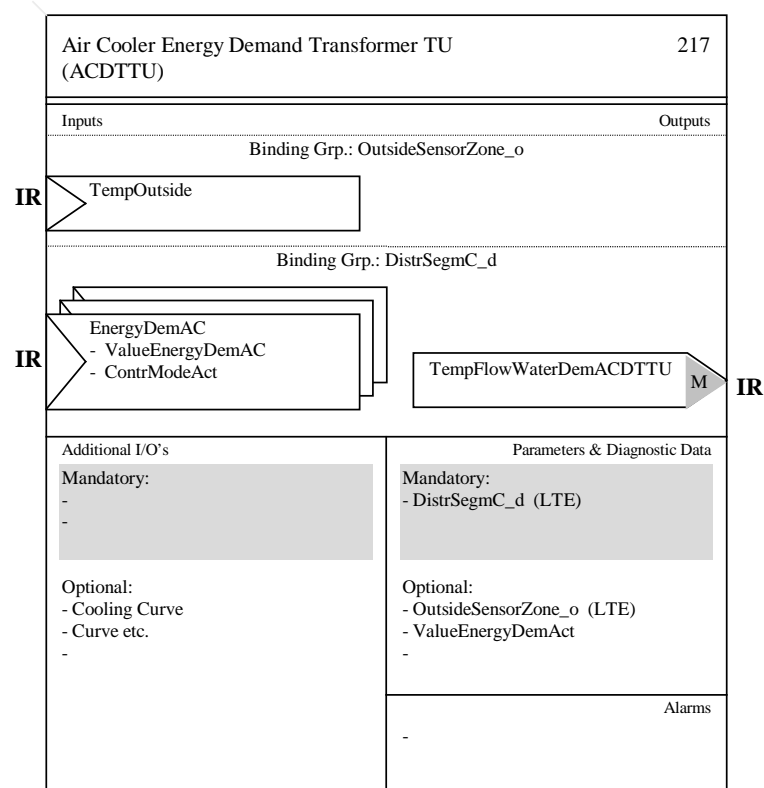
- ValueEnergyDemAct This value represents a theoretical average value of the input demands. The calculation is company specific.

Alarms

- CS

3.5.3 Constraints

None.

3.5.4 Functional Block Diagram

3.5.5 Datapoint description

Overview

Datapoints	Description / Remarks	Datapoint Type	Additional Info
Inputs			
Temp Outside	Outside temperature actual value with: - COV and RepPer - Z ₈ STATUS supported from FB 'Outside Temperature Sensor'	LTE: 205.100 DPT_TempHVACAbs_Z V ₁₆ Z ₈ S: 9.001 DPT_Value_Temp F ₁₆	LTE: O S: (GO) °C
n times			
Energy Dem AC	Energy demand value for Cold Flow Demand manager (water) (100 % = full cooling) plus ContrMode with: - COV and RepPer from FB various TU controller	LTE: 211.100 DPT_EnergyDemWater U ₈ N ₈ S: NA	LTE: M S: NA 0% ... 100 % plus Attribute
Value Energy Dem AC	Energy demand value for Cold Flow Demand manager (water) (100 % = full cooling) with: - COV and RepPer from FB various TU controller	LTE: NA S: 5.004 DPT_Percent_U8 U ₈	LTE: NA S: (GO) 0% ... 100 %
Contr Mode Act	Active Controlling Mode with: - COV and RepPer from FB various TU controller	LTE: NA S: 20.105 DPT_HVACContrMode N ₈	LTE: NA S: (GO) enum.
Outputs			
Temp Flow Water Dem ACD TTU	Value for demanded flow water temperature with: - COV and RepPer to FB 'Cold Flow Demand Manager'	LTE: 210.100 DPT_TempFlowWaterDemAbs V ₁₆ B ₁₆ S: NA	LTE: M S: NA °C plus attributes
Parameter			
Distr SegmC_d	LTE zoning number for Distribution Segment Cooling	202.002 DPT_UcountValue8_Z U ₈ Z ₈	M 1
Outside Sensor Zone_o	LTE zoning number for Outside Sensor Zone	202.002 DPT_UcountValue8_Z U ₈ Z ₈	O 1
Diagnostic Data			
Value Energy Dem Act	Theoretical, calculated value for the energy demand	5.004 DPT_Percent_U8 U ₈ ¹⁾	O 0% ... 100 %

¹⁾ Implementation of Properties using standard DPT see chapter 1.3.2

ACD TTU Runtime Interworking - Dependence on Configuration Modes

			STANDARD MODE	EXTENDED MODE	
		Basic FB	S-Mode	Standard Mode Interface	LTE-MODE
Inputs	TempOutside	(GO _b)		(GO)	O
	EnergyDemAC	NA _b	NA	NA	M
	ValueEnergyDemAC	(GO _b)		(GO)	NA
	ContrModeAct	(GO _b)		(GO)	NA
Outputs	TempFlowWaterDemACD TTU	NA _b	NA	NA	M

¹⁾ combined information not available in S-Mode (see also ²⁾)

²⁾ single information of 1) (only in S-Mode available, see also ¹⁾)

ACD TTU LTE specific Properties

		Support
Parameter	DistrSegmC_d	M
	OutsideSensorZone_o	O

ACD TTU Standard Properties of Interface Objects (or memory mapped DP)

		Support
Parameter	---	
DiagnosticData	ValueEnergyDemAct	O

3.5.6 Detailed specification of the Datapoints

3.5.6.1 Input TempOutside

Standard Mode

DP Name:	TempOutside	Abbr.:	---	Mandatory	<input type="checkbox"/>
FB Name:	ACDTTU	Can be internal			<input type="checkbox"/>
Description					
This information is provided by the Functional Block 'Outside Temperature Sensor'.					
Datapoint Type					
DPT_Name:	DPT_Value_Temp				
DPT Format:	F ₁₆	DPT_ID:	9.001		
Field	Description	Supp.	Range	Unit	Default
		O	full	°C	cs
Access Type					
◆ Input					
	N → this	<input type="checkbox"/>	1 → this	<input checked="" type="checkbox"/>	
	Spontaneous	<input checked="" type="checkbox"/>	Cyclically:	<input checked="" type="checkbox"/>	Time-out: 31 min (rec.)
	Request	<input type="checkbox"/>	Polling:	<input type="checkbox"/>	Period:
Communication Type					
◆ Group Object Datapoint					Mandatory: <input checked="" type="checkbox"/>
	Default Group Address:	---			
Dynamics					
	Power down:	Save:	<input type="checkbox"/>		
	Power up:	Value:	No initialisation:	<input type="checkbox"/>	Default value:
		Saved value:	<input type="checkbox"/>		<input type="checkbox"/>
			<input type="checkbox"/>	Read from bus:	<input type="checkbox"/>
Exception Handling					

Special Features					

LTE-HEE Mode

FB:	ACDTTU	LTE Client	TempOutside			Mandatory <input type="checkbox"/>
		Input Name:				Optional <input checked="" type="checkbox"/>
Description:						
This information is provided by the Functional Block 'Outside Temperature Sensor' and includes the STATUS of the information.						
DPT:	Name	DPT_TempHVACAbs_Z	DPT ID	205.100	Datatype format	V ₁₆ Z ₈
Field	Description				Sup.	Unit
Temperature	Outside temperature value				M	°C.
STATUS	Bitset				M	
- OutOfService	Sensor out of service				M	t/f
- Fault	Sensor value is corrupted				O	t/f
- Overridden	Sensor is temporarily overridden				O	t/f
- InAlarm	Sensor is in alarm				O	t/f
- AlarmUnAck	Acknowledgement of alarm				O	t/f
Communication:						
Binding Group:						
Class	Type				Default	
Geographical <input type="checkbox"/>						
Application Specific <input checked="" type="checkbox"/>	OutsideSensorZone				1	
Unassigned <input type="checkbox"/>	Broadcast <input type="checkbox"/> Configurable <input type="checkbox"/>					
DP Address:	IO Type(ID):		320 (OTS)		Property ID:	51
LTE-Service (event):	InfoReport Sniffer on Binding Group: --					
InfoReport <input checked="" type="checkbox"/>	Timeout: 31 Min					
LTE-Service (polling):	Read Wildcard / Resp Sniffer on Binding Group: --					
Read – Response <input type="checkbox"/>						
Value after Power-up:			Default Value <input checked="" type="checkbox"/>		Stored Value <input type="checkbox"/>	
Exception Handling:					Save at Powerdown <input type="checkbox"/>	

Special Features:						

3.5.6.2 Input EnergyDemAC

Standard Mode

Not applicable.

LTE-HEE Mode

FB:	ACDTTU	LTE Client	EnergyDemAC		Mandatory <input checked="" type="checkbox"/>	
		Input Name:			Optional <input type="checkbox"/>	
Description:						
This input is provided by the TU controllers and contains the value for the energy demand.						
DPT:	Name	DPT_EnergyDemWater	DPT ID	211.100	Datatype format	U ₈ N ₈
Field	Description				Sup.	Unit
Value	Energy demand value				M	%
Mode	0 = Auto 1 = Heat 2 = MrningWarmup 3 = Cool 4 = Night Purge 5 = Precool 6 = Off 7 = Test 8 = EmergHeat 9 = Fan only 10 = Free Cool 11 = Ice 20 = NoDem other enums.				M M O O O O O O O NA	enum. 0
Communication:						
Binding Group:						
Class	Type		Default			
Geographical <input type="checkbox"/>						
Application Specific <input checked="" type="checkbox"/>	DistrSegmC		1			
Unassigned <input type="checkbox"/>	Broadcast <input type="checkbox"/> Configurable <input type="checkbox"/>					
DP Address:	IO Type(ID):		258 (FCC) 261 (VAVCSA)	Property ID:		74
LTE-Service (event):	InfoReport Sniffer on Binding Group: --					
InfoReport <input checked="" type="checkbox"/>	Timeout: 31 Min					
LTE-Service (polling):	Read Wildcard / Resp Sniffer on Binding Group: --					
Read – Response <input type="checkbox"/>						
Value after Power-up:	Default Value <input checked="" type="checkbox"/>				Stored Value <input type="checkbox"/>	
Exception Handling:						Save at Powerdown <input type="checkbox"/>

Special Features:						

3.5.6.3 Input ValueEnergyDemAC**LTE-HEE Mode**

Not applicable.

Standard Mode

DP Name:	ValueEnergyDemAC	Abbr.:	---	Mandatory	<input type="checkbox"/>
FB Name:	ACDTTU			Can be internal	<input type="checkbox"/>
Description					
This Information is provided by the TU controllers and contains the value for the energy demand.					
Datapoint Type					
DPT_Name:	DPT_Percent_U8				
DPT Format:	U ₈	DPT_ID:	5.004		
Field	Description	Supp.	Range	Unit	Default
		M	full	%	cs
Access Type					
◆ Input					
N → this	<input checked="" type="checkbox"/>	1 → this	<input type="checkbox"/>		
Spontaneous	<input checked="" type="checkbox"/>	Cyclically:	<input checked="" type="checkbox"/>	Time-out:	31 min (rec.)
Request	<input type="checkbox"/>	Polling:	<input type="checkbox"/>	Period:	
Communication Type					
◆ Group Object Datapoint				Mandatory:	<input checked="" type="checkbox"/>
Default Group Address:		---			
Dynamics					
Power down:	Save:	<input type="checkbox"/>			
Power up:	Value:	No initialisation:	<input type="checkbox"/>	Default value:	<input checked="" type="checkbox"/>
	Saved value:	<input type="checkbox"/>			<input type="checkbox"/>
		<input type="checkbox"/>	Read from bus:	<input type="checkbox"/>	
Exception Handling					

Special Features					

3.5.6.4 Input ContrModeAct**LTE-HEE Mode**

Not applicable.

Standard Mode

DP Name:	ContrModeAct	Abbr.:	---	Mandatory	<input type="checkbox"/>
FB Name:	ACDTTU			Can be internal	<input type="checkbox"/>
Description					
This Information is provided by the TU controllers and contains the active ContrMode.					
Datapoint Type					
DPT_Name:	DPT_HVACContrMode				
DPT Format:	N ₈	DPT_ID:	20.105		
Field	Description	Supp.	Range	Unit	Default
	0 = Auto	M			0
	1 = Heat	O			
	2 = MrningWarmup	O			
	3 = Cool	O			
	4 = Night Purge	O			
	5 = Precool	O			
	6 = Off	O			
	7 = Test	O			
	8 = EmergHeat	O			
	9 = Fan only	O			
	10 = Free Cool	O			
	11 = Ice	O			
	20 = NoDem	O			
	other enums.	NA			
Access Type					
◆ Input					
	N → this	<input checked="" type="checkbox"/>	1 → this	<input type="checkbox"/>	
	Spontaneous	<input checked="" type="checkbox"/>	Cyclically:	<input checked="" type="checkbox"/>	Time-out: 31 min (rec.)
	Request	<input type="checkbox"/>	Polling:	<input type="checkbox"/>	Period:
Communication Type					
◆ Group Object Datapoint					Mandatory: <input checked="" type="checkbox"/>
	Default Group Address:	---			
Dynamics					
	Power down:	Save:	<input type="checkbox"/>		
	Power up:	Value:	No initialisation:	<input type="checkbox"/>	Default value:
			Saved value:	<input type="checkbox"/>	<input checked="" type="checkbox"/>
				<input type="checkbox"/>	Read from bus:
				<input type="checkbox"/>	<input type="checkbox"/>
Exception Handling					

Special Features					

3.5.6.5 Output TempFlowWaterDemACD TTU

Standard Mode

Not applicable.

LTE-HEE Mode

FB:	ACD TTU	LTE Server	TempFlowWaterDemACD TTU				Mandatory <input checked="" type="checkbox"/>	
		Output Name:					Optional <input type="checkbox"/>	
Description:								
This output contains the setpoint value for the flow water temperature controller.								
DPT:	Name	DPT_TempFlowWaterDemAbs	DPT ID	210.100	Datatype format	V ₁₆ B ₁₆		
Field	Description		Sup.	Range	Unit	COV	Default	
Temperature	Temperature setpoint value for flow water		M	full	°C	0.5	cs	
Attributes	Bit			Bitset B ₁₆				
- DemValid	0	Validity of FlowTempDem	M	true/false	bool	Y	false	
- AbsLoadPrio	1	Absolute load priority	O	true/false	bool	Y	false	
- ShiftLoadPrio	2	Shift load priority	O	true/false	bool	Y	false	
- MaxTempLimit	3	TempFlowDem with max limit	O	true/false	bool	Y	false	
- MinTempLimit	4	TempFlowDem with min limit	O	true/false	bool	Y	false	
- DHWReq	5	Demand from DHW, for DHW only	NA	false	bool	---	false	
- RoomCtrlReq	6	Demand from room control	O	true/false	bool	Y	true	
- VentReq	7	Demand from ventilation	NA	false	bool	---	false	
- AuxAllSeasonR	8	Demand from auxiliary consum.	O	true/false	bool	Y	false	
- SystPumpReq	9	Request for water circulation	O	true/false	bool	Y	false	
- EmergDem	10	resulting emergency heat demand for frost protection for DHW only	O	true/false	bool	Y	false	
- DHWLegioReq	11		NA	false	bool	---	false	
- reserved	12-15		NA			---	false	
Communication:								
Binding Group:								
Class		Type			Default			
Geographical <input type="checkbox"/>								
Application Specific <input checked="" type="checkbox"/>		DistrSegmC			1			
Unassigned <input type="checkbox"/>		Broadcast <input type="checkbox"/> Configurable <input type="checkbox"/>						
DP Address:		IO Type(ID): 217 (ACD TTU)		Property ID: 51				
LTE-Services (event):		COV <input checked="" type="checkbox"/> MinRepTime: 10 sec		Heartbeat: 15 min				
InfoReport <input checked="" type="checkbox"/>		Output per default communicating <input type="checkbox"/>		Binding Group Wildcard allowed <input type="checkbox"/>				
		Tx Prio: High <input type="checkbox"/> Normal <input checked="" type="checkbox"/> Low <input type="checkbox"/>						
(LTE Read-Response polling of the output shall always be supported)		Transm after Power-up: Stored Value <input type="checkbox"/> Act Value <input checked="" type="checkbox"/> Default Value <input type="checkbox"/>						
Property-Service (individual access):		Read only <input type="checkbox"/> Read/Write <input checked="" type="checkbox"/>						
Exception Handling:						Save at Powerdown <input type="checkbox"/>		

Special Features:								

3.5.6.6 Parameter DistrSegmC

FB: ACDTTU	Property Name (Server): DistrSegmC		Mandatory <input checked="" type="checkbox"/> Optional <input type="checkbox"/>	
Description:				
Number of the cooling distribution segment.				
DPT:	Name	DPT_UcountValue8_Z	DPT ID	202.002
Datatype format		U ₈ Z ₈		
Field	Description	Sup.	Range	Unit
Zone	Number of the Cooling Segment	M	(0) 1...31	1
STATUS				
- OutofService	zone active / inactive	O	true/false	Bitset
- all other bits	not supported, fixed to '0'	NA		bool
COMMAND				
- NormalWrite		M	enum	cs
- SetOSV & ResetOSV	Set zone inactive / active	O		
- all other commands	not supported	NA		
Communication:				
DP Address:	IO Type(ID):	217 (ACDTTU)	Property ID:	101
(in the server)	Start-Index:	1	N° of elements	1
Property access:	Read only <input type="checkbox"/>	Read/Write <input checked="" type="checkbox"/>		
Protection	Read level	-	Write level	-
Exception Handling: Value after Power-up: Stored Value <input checked="" type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input type="checkbox"/>				

Special Features:				
The device is not LTE communicating in this zone if zone is 'OutOfService'.				

3.5.6.7 Parameter OutsideSensorZone

FB: ACDTTU	Property Name (Server): OutsideSensorZone		Mandatory <input type="checkbox"/> Optional <input checked="" type="checkbox"/>	
Description:				
Number of the outside sensor zone.				
DPT:	Name	DPT_UcountValue8_Z	DPT ID	202.002
Datatype format		U ₈ Z ₈		
Field	Description	Sup.	Range	Unit
Zone	Number of the Outside Sensor Zone	M	(0) 1...31	1
STATUS				
- OutofService	zone active / inactive	O	true/false	Bitset
- all other bits	not supported, fixed to '0'	NA		bool
COMMAND				
- NormalWrite		M	enum	cs
- SetOSV & ResetOSV	Set zone inactive / active	O		
- all other commands	not supported	NA		
Communication:				
DP Address:	IO Type(ID):	217 (ACDTTU)	Property ID:	102
(in the server)	Start-Index:	1	N° of elements	1
Property access:	Read only <input type="checkbox"/>	Read/Write <input checked="" type="checkbox"/>		
Protection	Read level	-	Write level	-
Exception Handling: Value after Power-up: Stored Value <input checked="" type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input type="checkbox"/>				

Special Features:				
The device is not LTE communicating in this zone if zone is 'OutOfService'.				

3.5.6.8 Diagnostic Data ValueEnergyDemAct

FB:	ACDTTU	Property Name (Server):	ValueEnergyDemAct				Mandatory <input type="checkbox"/>	
							Optional <input checked="" type="checkbox"/>	
Description:								
Calculated value of energy demand.								
DPT:	Name	DPT_Percent_U8	DPT ID	5.004	Datatype format	U ₈		
Field	Description				Sup.	Range	Unit	Default
Value	Calculated energy demand value				M	full	%	cs
Communication:								
DP Address:		IO Type(ID):		217 (ACDTTU)	Property ID:		111	
(in the server)		Start-Index:		1	N° of elements		1	
Property access:		Read only <input checked="" type="checkbox"/>		Read/Write <input type="checkbox"/>				
Protection		Read level		-	Write level		-	
Exception Handling: Value after Power-up: Stored Value <input checked="" type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input type="checkbox"/>								

Special Features:								

3.6 Ventilation Demand Transformer TU (VDTTU)

3.6.1 Aims and objectives

The Functional Block 'Ventilation Demand Transformer TU' transforms the energy demand and the fresh air demand information out of the terminal units into a supply air temperature value set (heat and cool) and a fresh air demand value.

The determination of the temperature values as well as the fresh air demand value is manufacturer specific.

The limitation of the supply air temperature setpoint shall be set via the Parameter TempSupplyAirSetpMin and TempSupplyAirSetpMax.

Example:

3.6.2 Functional specification

Inputs

- TempOutside This information contains the outside temperature, delivered from another device.
- EnergyDemAir
 (n times) This information is delivered by the TU controllers that need preconditioned air.
 (-100 % = full heating, +100 % = full cooling)
 The LTE information is completed with attributes containing information from the ContrMode and the EmergencyMode.
- ValueEnergyDemAir
 (n times) This information is delivered by the controllers that need preconditioned air.
 (-100 % = full heating, +100 % = full cooling)
 (only in S-Mode separate, see EnergyDemAir)
- ContrModeAct
 (n times) The controlling mode delivered by the TU controllers.
 (only in S-Mode separate, see EnergyDemAir)
- EmergMode
 (n times) The emergency mode delivered by the supervisor.
 (only in S-Mode separate, see EnergyDemAir)
- ValueFreshAirDem
 (n times) This information is delivered by the TU controllers that need fresh air.
 (0% = minimum fresh air, 100 % = maximum fresh air)

Outputs

- TempSupplyAirSetpSet This information contains the setpoints for the supply air temperature control (2 values, one for heating, one for cooling) as well as the information about the ContrMode and the EmergencyMode.
- ValueFreshAirSetp This value represents the setpoint for fresh air demand from the supply air temperature control.

Binding Groups (LTE)

The Functional Block shows 2 different binding groups.

- **DistrSegmV** This binding group defines the distribution segment ventilation.
- **OutsideSensorZone** This binding group defines the outside sensor zone, from which the outside temperature will be taken.

Parameters

- **TempSupplyAirSetpMin** Minimum supply air temperature setting to ensure no condensation.
- **TempSupplyAirSetpMax** Maximum supply air temperature setting to ensure no heat dumping or smell.

Diagnostic Data

- **ValueEnergyDemAirActMin** This value represents the minimum value of the energy demand inputs.
- **ValueEnergyDemAirActMax** This value represents the maximum value of the energy demand inputs.
- **ValueFreshAirDemAct** This value represents a theoretical average value for the fresh air demand. The calculation is company specific.

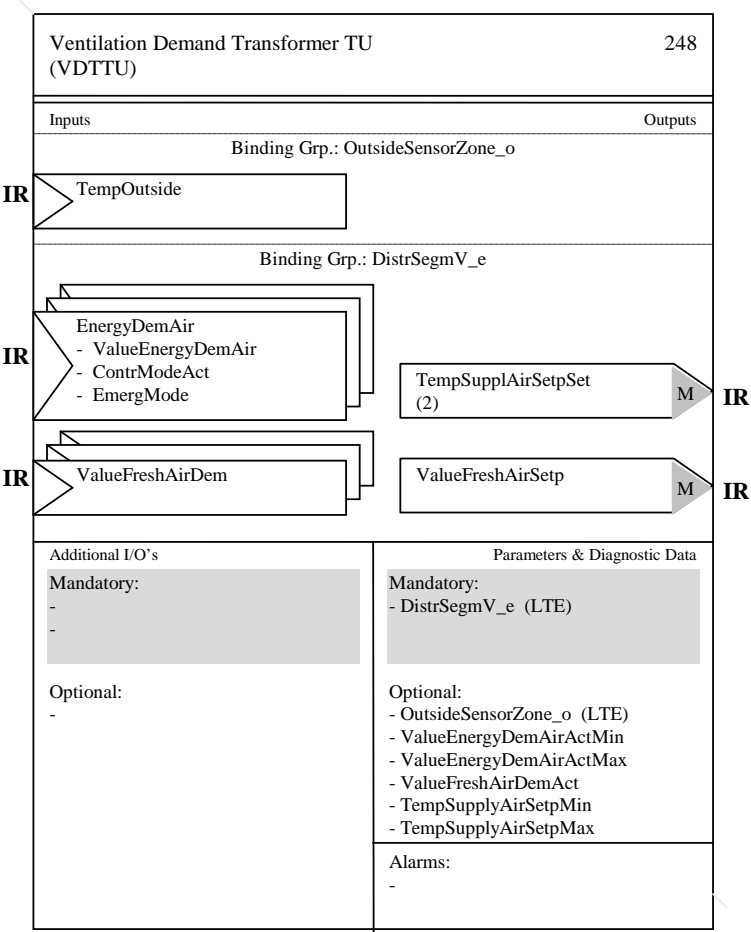
Alarms

- **cs**

3.6.3 Constraints

None.

3.6.4 Functional Block Diagram



3.6.5 Datapoint description

Overview

Datapoints	Description / Remarks	Datapoint Type	Additional Info
Inputs			
Temp Outside	Outside temperature actual value with: - COV and RepPer - Z ₈ STATUS supported from FB 'Outside Temperature Sensor'	LTE: 205.100 DPT_TempHVACAbs_Z V ₁₆ Z ₈ S: 9.001 DPT_Value_Temp F ₁₆	LTE: O S: (GO) °C
n times			
Energy Dem Air	Energy demand value for Air Handling Unit (Air) -100 % = full heating +100 % = full cooling plus modes with: - COV and RepPer from FB various TU controller	LTE: 223.100 DPT_EnergyDemAir V ₈ N ₈ N ₈ S: NA	LTE: M S: NA -100° ... +100 % plus modes
Value Energy Dem Air	Energy demand value for Air Handling Unit (Air) -100 % = full heating +100 % = full cooling with: - COV and RepPer from FB various TU controller	LTE: NA S: 6.001 DPT_Percent_V8 V ₈	LTE: NA S: (GO) -100° ... +100 %
Contr Mode Act	Active Controlling Mode with: - COV and RepPer from FB various TU controller	LTE: NA S: 20.105 DPT_HVACContrMode N ₈	LTE: NA S: (GO) enum
Emerg Mode	EmergencyMode with: - COV and RepPer from FB HVAC Emergency Source	LTE: NA S: 20.106 DPT_HVACEmergMode N ₈	LTE: NA S: (GO) enum
Value Fresh Air Demand	Value for primary fresh air demand with: - COV and RepPer from FB various TU controller	LTE: 202.001 DPT_RelValue_Z U ₈ Z ₈ S: 5.004 DPT_Percent_U8 U ₈	LTE: O S: (GO) %
Outputs			
Temp Supply Air Setp Set	Pair of temperature setpoints (for heating and for cooling) plus modes with - COV and RepPer to FB 'Supply Air Temperature Control'	LTE: 224.100 DPT_TempSupplyAirSetpSet V ₁₆ V ₁₆ N ₈ N ₈ S: NA	LTE: M S: NA °C (2 values) plus modes
Value Fresh Air Setp	Value for fresh air demand with: - COV and RepPer to FB 'Supply Air Temperature Control'	LTE: 202.001 DPT_RelValue_Z U ₈ Z ₈ S: NA	LTE: M S: NA %

Datapoints	Description / Remarks	Datapoint Type	Additional Info
Parameter			
Distr SegmV	LTE zoning number for Distribution Segment Ventilation	202.002 DPT_UcountValue8_Z U ₈ Z ₈	M 1
Outside Sensor Zone	LTE zoning number for Outside Sensor Zone	202.002 DPT_UcountValue8_Z U ₈ Z ₈	O 1
TempSupplyAirSetp Min	Minimum supply air temperature setting to ensure no condensation.	205.100 DPT_TempHVACAbs_Z	O
TempSupplyAirSetp Max	Maximum supply air temperature setting to ensure no heat dumping or smell.	205.100 DPT_TempHVACAbs_Z	O
Diagnostic Data			
Value Energy Dem Air Act Min	Minimum value of the energy demand inputs	6.001 ¹⁾ DPT_Percent_V8 V ₈	O -100° ... +100 %
Value Energy Dem Air Act Max	Maximum value of the energy demand inputs	6.001 ¹⁾ DPT_Percent_V8 V ₈	O -100° ... +100 %
Value Fresh Air Dem Act	Theoretical, calculated value for the fresh air demand	202.001 ¹⁾ DPT_RelValue_Z U ₈ Z ₈	O %

¹⁾ Implementation of Properties using standard DPT see chapter 1.3.2

VDTTU Runtime Interworking - Dependence on Configuration Modes

			STANDARD MODE	EXTENDED MODE		
			Basic FB	S-Mode	Standard Mode Interface	LTE-MODE
Inputs	TempOutside	(GO _b)		(GO)	O	
	EnergyDemAir ¹⁾	NA _b	NA	NA	M	
	ValueEnergyDemAir ²⁾	(GO _b)		(GO)	NA	
	ContrModeActive ²⁾	(GO _b)		(GO)	NA	
	EmergMode ²⁾	(GO _b)		(GO)	NA	
	ValueFreshAirDem	(GO _b)		(GO)	O	
Outputs	TempSupplyAirSetpSet	NA _b	NA	NA	M	
	ValueFreshAirSetp	NA _b	NA	NA	O	

¹⁾ combined information not available in S-Mode (see also ²⁾)

²⁾ single information of 1) (only in S-Mode available, see also ¹⁾)

VDTTU LTE specific Properties

		Support
Parameter	DistrSegmV	M
	OutsideSensorZone	O

VDTTU Standard Properties of Interface Objects (or memory mapped DP)

		Support
Parameter	TempSupplyAirSetpMin	O
	TempSupplyAirSetpMax	O
DiagnosticData	ValueEnergyDemAirEff	O
	ValueFreshAirDemEff	O

3.6.6 Detailed specification of the Datapoints

3.6.6.1 Input TempOutside

Standard Mode

DP Name:	TempOutside	Abbr.:	---	Mandatory	<input type="checkbox"/>
FB Name:	VDTTU			Can be internal	<input type="checkbox"/>
Description					
This information is provided by the Functional Block 'Outside Temperature Sensor'.					
Datapoint Type					
DPT_Name:	DPT_Value_Temp				
DPT Format:	F ₁₆	DPT_ID:	9.001		
Field	Description	Supp.	Range	Unit	Default
		O	full	°C	cs
Access Type					
◆ Input					
	N → this	<input type="checkbox"/>	1 → this	<input checked="" type="checkbox"/>	
	Spontaneous	<input checked="" type="checkbox"/>	Cyclically:	<input checked="" type="checkbox"/>	Time-out: 31 min (rec.)
	Request	<input type="checkbox"/>	Polling:	<input type="checkbox"/>	Period:
Communication Type					
◆ Group Object Datapoint					Mandatory: <input checked="" type="checkbox"/>
	Default Group Address:	---			
Dynamics					
	Power down:	Save:	<input type="checkbox"/>		
	Power up:	Value:	No initialisation:	<input type="checkbox"/>	Default value:
		Saved value:	<input type="checkbox"/>		<input type="checkbox"/>
			<input type="checkbox"/>	Read from bus:	<input type="checkbox"/>
Exception Handling					

Special Features					

LTE-HEE Mode

FB: VDTTU	LTE Client Input Name: TempOutside	Mandatory <input type="checkbox"/> Optional <input checked="" type="checkbox"/>
Description:		
This information is provided by the Functional Block 'Outside Temperature Sensor' and includes the STATUS of the information.		
DPT:	Name	DPT_TempHVACAbs_Z
	DPT ID	205.100
	Datatype format	V ₁₆ Z ₈
Field	Description	Sup. Unit Default
Temperature	Outside temperature value	M °C. cs
STATUS	Bitset	M
- OutOfService	Sensor out of service	M t/f false
- Fault	Sensor value is corrupted	O t/f false
- Overridden	Sensor is temporarily overridden	O t/f false
- InAlarm	Sensor is in alarm	O t/f false
- AlarmUnAck	Acknowledgement of alarm	O t/f false
Communication:		
Binding Group:		
Class	Type	Default
Geographical <input type="checkbox"/>		
Application Specific <input checked="" type="checkbox"/>	OutsideSensorZone	1
Unassigned <input type="checkbox"/>	Broadcast <input type="checkbox"/> Configurable <input type="checkbox"/>	
DP Address:	IO Type(ID): 320 (OTS)	Property ID: 51
LTE-Service (event):	InfoReport Sniffer on Binding Group:	--
InfoReport <input checked="" type="checkbox"/>	Timeout:	31 Min
LTE-Service (polling):	Read Wildcard / Resp Sniffer on Binding Group:	--
Read – Response <input type="checkbox"/>		
Value after Power-up:	Default Value <input checked="" type="checkbox"/>	Stored Value <input type="checkbox"/>
Exception Handling:	Save at Powerdown	<input type="checkbox"/>

Special Features:		

3.6.6.2 Input EnergyDemAir**Standard Mode**

Not applicable.

LTE-HEE Mode

FB:	VDTTU	LTE Client	EnergyDemAir		Mandatory <input checked="" type="checkbox"/>	
		Input Name:			Optional <input type="checkbox"/>	
Description:						
This Information is provided by the TU controllers and contains the value for the energy demand as well as the attributes ContrModeAct and EmergencyMode.						
DPT:	Name	DPT_EnergyDemAir	DPT ID	223.100	Datatype format	V₈N₈N₈
Field	Description				Sup.	Unit
Value	Energy demand value				M	%
Mode	0 = Auto 1 = Heat 3 = Cool 5 = Precool 7 = Test 9 = Fan only 11 = Ice other enums.				M M O O O O O O O NA	Enum
	2 = MrningWarmup 4 = Night Purge 6 = Off 8 = EmergHeat 10 = Free Cool 20 = NoDem					
EmergMode	0 = Normal 1 = EmergPressure 3 = EmergPurge 5 = EmergFire other enums.				M M O O O NA	Enum
	2 = EmergDepressure 4 = EmergShutdown					0
Communication:						
Binding Group:						
Class	Type				Default	
Geographical <input type="checkbox"/>						
Application Specific <input checked="" type="checkbox"/>	DistrSegmV				1	
Unassigned <input type="checkbox"/>	Broadcast <input type="checkbox"/>	Configurable <input type="checkbox"/>				
DP Address:	IO Type(ID):		261 (VAVCDA)		Property ID:	75
LTE-Service (event):	InfoReport Sniffer on Binding Group: --					
InfoReport <input checked="" type="checkbox"/>	Timeout: 31 Min					
LTE-Service (polling):	Read Wildcard / Resp Sniffer on Binding Group: --					
Read – Response <input type="checkbox"/>						
Value after Power-up:	Default Value <input checked="" type="checkbox"/>				Stored Value <input type="checkbox"/>	
Exception Handling:					Save at Powerdown <input type="checkbox"/>	

Special Features:						

3.6.6.3 Input ValueEnergyDemAir**LTE-HEE Mode**

Not applicable.

Standard Mode

DP Name:	ValueEnergyDemAir	Abbr.:	---	Mandatory	<input type="checkbox"/>
FB Name:	VDTTU			Can be internal	<input type="checkbox"/>
Description					
This Information is provided by the TU controllers and contains the value for the energy demand.					
Datapoint Type					
DPT_Name:	DPT_Percent_V8				
DPT Format:	V ₈	DPT_ID:	6.001		
Field	Description	Supp.	Range	Unit	Default
		M	full	%	cs
Access Type					
◆ Input					
N → this	<input checked="" type="checkbox"/>	1 → this	<input type="checkbox"/>		
Spontaneous	<input checked="" type="checkbox"/>	Cyclically:	<input checked="" type="checkbox"/>	Time-out:	31 min (rec.)
Request	<input type="checkbox"/>	Polling:	<input type="checkbox"/>	Period:	
Communication Type					
◆ Group Object Datapoint				Mandatory:	<input checked="" type="checkbox"/>
Default Group Address:		---			
Dynamics					
Power down:	Save:	<input type="checkbox"/>			
Power up:	Value:	No initialisation:	<input type="checkbox"/>	Default value:	<input checked="" type="checkbox"/>
	Saved value:	<input type="checkbox"/>			<input type="checkbox"/>
		<input type="checkbox"/>	Read from bus:	<input type="checkbox"/>	
Exception Handling					

Special Features					

3.6.6.4 Input ContrModeAct**LTE-HEE Mode**

Not applicable.

Standard Mode

DP Name:	ContrModeAct	Abbr.:	---	Mandatory	<input type="checkbox"/>
FB Name:	VDTTU			Can be internal	<input type="checkbox"/>
Description					
This Information is provided by the TU controllers and contains the active ContrMode.					
Datapoint Type					
DPT_Name:	DPT_HVACContrMode				
DPT Format:	N ₈	DPT_ID:	20.105		
Field	Description	Supp.	Range	Unit	Default
Mode		M	0...20	enum	0
	0 = Auto	M			
	1 = Heat	O			
	2 = MrningWarmup	O			
	3 = Cool	O			
	4 = Night Purge	O			
	5 = Precool	O			
	6 = Off	O			
	7 = Test	O			
	8 = EmergHeat	O			
	9 = Fan only	O			
	10 = Free Cool	O			
11 = Ice	O				
20 = NoDem	O				
other enums.	NA				
Access Type					
◆ Input					
N → this	<input checked="" type="checkbox"/>	1 → this	<input type="checkbox"/>		
Spontaneous	<input checked="" type="checkbox"/>	Cyclically:	<input checked="" type="checkbox"/>	Time-out:	31 min (rec.)
Request	<input type="checkbox"/>	Polling:	<input type="checkbox"/>	Period:	
Communication Type					
◆ Group Object Datapoint				Mandatory:	<input checked="" type="checkbox"/>
Default Group Address:		---			
Dynamics					
Power down:	Save:	<input type="checkbox"/>			
Power up:	Value:	No initialisation:	<input type="checkbox"/>	Default value:	<input checked="" type="checkbox"/>
	Saved value:	<input type="checkbox"/>		<input type="checkbox"/>	
		<input type="checkbox"/>	Read from bus:	<input type="checkbox"/>	
Exception Handling					

Special Features					

3.6.6.5 Input EmergencyMode**LTE-HEE Mode**

Not applicable.

Standard Mode

DP Name:	EmergMode	Abbr.:	---	Mandatory	<input type="checkbox"/>
FB Name:	VDTTU			Can be internal	<input type="checkbox"/>
Description					
This Information is provided by the TU controllers and contains the active EmergencyMode.					
Datapoint Type					
DPT_Name:	DPT_HVAVEmergMode				
DPT Format:	N ₈	DPT_ID:	20.106		
Field	Description	Supp.	Range	Unit	Default
Mode		M	0...5	Enum	0
		M			
	0 = Normal	O			
	1 = EmergPressure 2 = EmergDepressure	O			
	3 = EmergPurge 4 = EmergShutdown	O			
	5 = EmergFire other enums.	NA			
Access Type					
◆ Input					
N → this	<input checked="" type="checkbox"/>	1 → this	<input type="checkbox"/>		
Spontaneous	<input checked="" type="checkbox"/>	Cyclically:	<input checked="" type="checkbox"/>	Time-out:	31 min (rec.)
Request	<input type="checkbox"/>	Polling:	<input type="checkbox"/>	Period:	
Communication Type					
◆ Group Object Datapoint				Mandatory:	<input checked="" type="checkbox"/>
Default Group Address:		---			
Dynamics					
Power down:	Save:	<input type="checkbox"/>			
Power up:	Value:	No initialisation:	<input type="checkbox"/>	Default value:	<input checked="" type="checkbox"/>
		Saved value:	<input type="checkbox"/>		<input type="checkbox"/>
			<input type="checkbox"/>	Read from bus:	<input type="checkbox"/>
Exception Handling					

Special Features					

3.6.6.6 Input ValueFreshAirDem**Standard Mode**

DP Name:	ValueFreshAirDem	Abbr.:	---	Mandatory	<input type="checkbox"/>
FB Name:	VDTTU	Can be internal			<input type="checkbox"/>
Description					
This Information is provided by the TU controllers and contains the demand for fresh air.					
Datapoint Type					
DPT_Name:	DPT_Percent_U8				
DPT Format:	U ₈	DPT_ID:	5.004		
Field	Description	Supp.	Range	Unit	Default
		O	full	%	cs
Access Type					
◆ Input					
N → this	<input checked="" type="checkbox"/>	1 → this	<input type="checkbox"/>		
Spontaneous	<input checked="" type="checkbox"/>	Cyclically:	<input checked="" type="checkbox"/>	Time-out:	31 min (rec.)
Request	<input type="checkbox"/>	Polling:	<input type="checkbox"/>	Period:	
Communication Type					
◆ Group Object Datapoint				Mandatory:	<input checked="" type="checkbox"/>
Default Group Address:		---			
Dynamics					
Power down:	Save:	<input type="checkbox"/>			
Power up:	Value:	No initialisation:	<input type="checkbox"/>	Default value:	<input checked="" type="checkbox"/>
	Saved value:	<input type="checkbox"/>		<input type="checkbox"/>	
		<input type="checkbox"/>	Read from bus:	<input type="checkbox"/>	
Exception Handling					

Special Features					

LTE-HEE Mode

FB:	VDTTU	LTE Client	ValueFreshAirDem		Mandatory <input type="checkbox"/>	
		Input Name:			Optional <input checked="" type="checkbox"/>	
Description:						
This input is provided by the TU controllers and contains the value for the fresh air demand.						
DPT:	Name	DPT_RelValue_Z	DPT ID	202.001	Datatype format	U ₈ Z ₈
Field	Description			Sup.	Unit	Default
Value	Fresh air demand value			M	%	cs
STATUS				M	bitset	
- OutOfService (OSV)	OSV = value is not valid			M	true/false	false
- all other bits	not supported			NA		
Communication:						
Binding Group:						
Class	Type			Default		
Geographical <input type="checkbox"/>						
Application Specific <input checked="" type="checkbox"/>	DistrSegmV			1		
Unassigned <input type="checkbox"/>	Broadcast <input type="checkbox"/> Configurable <input type="checkbox"/>					
DP Address:	IO Type(ID): 261 (VAVCDA)			Property ID: 76		
LTE-Service (event):	InfoReport Sniffer on Binding Group: --					
InfoReport <input checked="" type="checkbox"/>	Timeout: 31 Min					
LTE-Service (polling):	Read Wildcard / Resp Sniffer on Binding Group: --					
Read – Response <input type="checkbox"/>						
Value after Power-up:	Default Value <input checked="" type="checkbox"/>			Stored Value <input type="checkbox"/>		
Exception Handling:				Save at Powerdown <input type="checkbox"/>		

Special Features:						

3.6.6.7 Output TempSupplyAirSetpSet**Standard Mode**

Not applicable.

LTE-HEE Mode

FB:	VDTTU	LTE Server	TempSupplyAirSetpSet				Mandatory <input checked="" type="checkbox"/>	
		Output Name:					Optional <input type="checkbox"/>	
Description:								
This output contains the setpoint values for heating and for cooling and attributes for the supply air temperature controller.								
DPT:	Name	DPT_ TempSuplAirSetpSet[2]	DPT ID	224.100	Datatype format	V ₁₆ V ₁₆ N ₈ N ₈		
Field	Description		Sup.	Range	Unit	COV	Default	
Temperature	Temperature setpoint value for cooling		M	full	°C	0.2	cs	
Temperature	Temperature setpoint value for heating		M	full	°C	0.2	cs	
Mode	0 = Auto 1 = Heat 2 = MrnngWmup 3 = Cool 4 = Night Purge 5 = Precool 6 = Off 7 = Test 8 = EmergHeat 9 = Fan only 10 = Free Cool 11 = Ice 20 = NoDem other enums		M M O O O O O O O NA	0...20	enum.	Y	0	
EmergMode	0 = Normal 1 = EmrgPress2 = EmrgDepress 3 = EmrgPurge 4 = EmrgShutdown 5 = EmrgFire other enums		M M O O O NA	0...5	enum.	Y	0	
Communication:								
Binding Group:								
Class		Type				Default		
Geographical <input type="checkbox"/>								
Application Specific <input checked="" type="checkbox"/>		DistrSegmV				1		
Unassigned <input type="checkbox"/>		Broadcast <input type="checkbox"/> Configurable <input type="checkbox"/>						
DP Address:		IO Type(ID):		248 (VDTTU)	Property ID:		51	
LTE-Services (event):		COV <input checked="" type="checkbox"/>		MinRepTime:	10 sec	Heartbeat:	15 min	
InfoReport <input checked="" type="checkbox"/>		Output per default communicating <input type="checkbox"/>		Binding Group Wildcard allowed <input type="checkbox"/>				
		Tx Prio:		High <input type="checkbox"/>	Normal <input checked="" type="checkbox"/>	Low <input type="checkbox"/>		
(LTE Read-Response polling of the output shall always be supported)		Transm after Power-up: Stored Value <input type="checkbox"/> Act Value <input checked="" type="checkbox"/> Default Value <input type="checkbox"/>						
Property-Service (individual access):		Read only <input type="checkbox"/>		Read/Write <input checked="" type="checkbox"/>				
Exception Handling:						Save at Powerdown <input type="checkbox"/>		

Special Features:								

3.6.6.8 Output ValueFreshAirSetp**Standard Mode**

Not applicable.

LTE-HEE Mode

FB: VDTTU	LTE Server	ValueFreshAirSetp					Mandatory <input type="checkbox"/>	
	Output Name:						Optional <input checked="" type="checkbox"/>	
Description:								
This output contains the fresh air setpoint value for the supply air temperature controller.								
DPT:	Name	DPT_RelValue_Z	DPT ID	202.001	Datatype format	U ₈ Z ₈		
Field	Description		Sup.	Range	Unit	COV	Default	
Value	Fresh air demand setpoint value		M	full	%	10	cs	
STATUS	OSV = value is not valid		M	true/false	bitset.	Y	false	
- OutOfService (OSV)	not supported		O					
- all other bits			NA					
COMMAND	not supported		NA					
Communication:								
Binding Group:								
Class		Type			Default			
Geographical <input type="checkbox"/>								
Application Specific <input checked="" type="checkbox"/>		DistrSegmV			1			
Unassigned <input type="checkbox"/>		Broadcast <input type="checkbox"/> Configurable <input type="checkbox"/>						
DP Address:		IO Type(ID): 248 (VDTTU)			Property ID: 52			
LTE-Services (event):		COV <input checked="" type="checkbox"/> MinRepTime: 10 sec			Heartbeat: 15 min			
InfoReport <input checked="" type="checkbox"/>		Output per default communicating <input type="checkbox"/>			Binding Group Wildcard allowed <input type="checkbox"/>			
		Tx Prio: High <input type="checkbox"/> Normal <input checked="" type="checkbox"/> Low <input type="checkbox"/>						
(LTE Read-Response polling of the output shall always be supported)		Transm after Power-up: Stored Value <input type="checkbox"/> Act Value <input checked="" type="checkbox"/> Default Value <input type="checkbox"/>						
Property-Service (individual access):		Read only <input type="checkbox"/>			Read/Write <input checked="" type="checkbox"/>			
Exception Handling:						Save at Powerdown <input type="checkbox"/>		

Special Features:								

3.6.6.9 Parameter DistrSegmV

FB:	VDTTU	Property Name (Server):	DistrSegmV	Mandatory <input checked="" type="checkbox"/>		Optional <input type="checkbox"/>	
Description:							
Number of the ventilation distribution segment.							
DPT:	Name	DPT_UcountValue8_Z	DPT ID	202.002	Datatype format	U ₈ Z ₈	
Field	Description			Sup.	Range	Unit	Default
Zone	Number of the Ventilation Segment			M	1...31		1
STATUS							
- OutofService	zone active / inactive			O	true/false	Bitset	false
- all other bits	not supported, fixed to '0'			NA			false
COMMAND					enum		cs
- NormalWrite				M			
- SetOSV & ResetOSV	Set zone inactive / active			O			
- all other commands	not supported			NA			
Communication:							
DP Address:		IO Type(ID):		248 (VDTTU)	Property ID:		101
(in the server)		Start-Index:		1	N° of elements		1
Property access:		Read only <input type="checkbox"/>		Read/Write <input checked="" type="checkbox"/>			
Protection		Read level		-	Write level		-
Exception Handling: Value after Power-up: Stored Value <input checked="" type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input type="checkbox"/>							
Special Features:							
The device is not LTE communicating in this zone if zone is 'OutOfService'.							

3.6.6.10 Parameter OutsideSensorZone

FB:	VDTTU	Property Name (Server):	OutsideSensorZone	Mandatory <input type="checkbox"/>		Optional <input checked="" type="checkbox"/>	
Description:							
Number of the outside sensor zone.							
DPT:	Name	DPT_UcountValue8_Z	DPT ID	202.002	Datatype format	U ₈ Z ₈	
Field	Description			Sup.	Range	Unit	Default
Zone	Number of the Outside Sensor Zone			M	(0) 1...31		1
STATUS							
- OutofService	zone active / inactive			O	true/false	Bitset	false
- all other bits	not supported, fixed to '0'			NA			false
COMMAND					enum		cs
- NormalWrite				M			
- SetOSV & ResetOSV	Set zone inactive / active			O			
- all other commands	not supported			NA			
Communication:							
DP Address:		IO Type(ID):		248 (VDTTU)	Property ID:		102
(in the server)		Start-Index:		1	N° of elements		1
Property access:		Read only <input type="checkbox"/>		Read/Write <input checked="" type="checkbox"/>			
Protection		Read level		-	Write level		-
Exception Handling: Value after Power-up: Stored Value <input checked="" type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input type="checkbox"/>							
Special Features:							
The device is not LTE communicating in this zone if zone is 'OutOfService'.							

3.6.6.11 Parameter: TempSupplyAirSetpMin

FB:	VDTTU	Property Name (Server): TempSupplyAirSetpMin				Mandatory <input type="checkbox"/>	
Optional <input checked="" type="checkbox"/>							
Description:							
Min supply air temperature limitation for the supply air temperature controller. Supply air temperature setpoint shall not be below this limit.							
DPT:	Name	DPT_TempHVACAbs_Z	DPT ID	205.100	Datatype format	V ₁₆ Z ₈	
Field	Description			Sup.	Range	Unit	Default
Temp	Temperature value			M	full range	° C	cs
Status	Limitation active /inactive			O	true/false	bitset	false
- OutOfService	not supported, fixed to '0'			NA			
- all other flags							
Command	Set limitation parameter inactive / active			M		enum	
- NormalWrite	not supported			O			
- SetOSV & ResetOSV							
- all other commands				NA			
Communication:							
DP Address:		IO Type(ID):		248 (VDTTU)	Property ID:		114
(in the server)		Start-Index:		1	N° of elements		1
Property access:		Read only <input type="checkbox"/>		Read/Write <input checked="" type="checkbox"/>			
Protection		Read level		--	Write level		--
Exception Handling: Value after Powerup: Stored Value <input checked="" type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input type="checkbox"/>							
--							
Special Features:							
Limitation function is activated or deactivated by the 'OutOfService' Status							

3.6.6.12 Parameter: TempSupplyAirSetpMax

FB:	VDTTU	Property Name (Server): TempSupplyAirSetpMax				Mandatory <input type="checkbox"/>	
Optional <input checked="" type="checkbox"/>							
Description:							
Max supply air temperature limitation for the supply air temperature controller. Supply air temperature setpoint shall not be above this limit.							
DPT:	Name	DPT_TempHVACAbs_Z	DPT ID	205.100	Datatype format	V ₁₆ Z ₈	
Field	Description			Sup.	Range	Unit	Default
Temp	Temperature value			M	full range	° C	cs
Status	Limitation active /inactive			O	true/false	bitset	false
- OutOfService	not supported, fixed to '0'			NA			
- all other flags							
Command	Set limitation parameter inactive / active			M		enum	
- NormalWrite	not supported			O			
- SetOSV & ResetOSV							
- all other commands				NA			
Communication:							
DP Address:		IO Type(ID):		248 (VDTTU)	Property ID:		115
(in the server)		Start-Index:		1	N° of elements		1
Property access:		Read only <input type="checkbox"/>		Read/Write <input checked="" type="checkbox"/>			
Protection		Read level		--	Write level		--
Exception Handling: Value after Powerup: Stored Value <input checked="" type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input type="checkbox"/>							
--							
Special Features:							
Limitation function is activated or deactivated by the 'OutOfService' Status							

3.6.6.13 Diagnostic Data ValueEnergyDemAirActMin

FB:	VDTTU	Property Name (Server): ValueEnergyDemAirActMin				Mandatory <input type="checkbox"/>		Optional <input checked="" type="checkbox"/>	
Description:									
Calculated minimum value of energy demands.									
DPT:	Name	DPT_Percent_V8	DPT ID	6.001	Datatype format		V ₈		
Field	Description				Sup.	Range	Unit	Default	
Value	Calculated min energy demand value				M	full	%	cs	
Communication:									
DP Address:		IO Type(ID):		248 (VDTTU)	Property ID:		111		
(in the server)		Start-Index:		1	N° of elements		1		
Property access:		Read only <input checked="" type="checkbox"/>		Read/Write <input type="checkbox"/>					
Protection		Read level		-	Write level		-		
Exception Handling: Value after Power-up: Stored Value <input checked="" type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input type="checkbox"/>									

Special Features:									

3.6.6.14 Diagnostic Data ValueEnergyDemAirActMax

FB:	VDTTU	Property Name (Server): ValueEnergyDemAirActMax				Mandatory <input type="checkbox"/>		Optional <input checked="" type="checkbox"/>	
Description:									
Calculated maximum value of energy demands.									
DPT:	Name	DPT_Percent_V8	DPT ID	6.001	Datatype format		V ₈		
Field	Description				Sup.	Range	Unit	Default	
Value	Calculated max energy demand value				M	full	%	cs	
Communication:									
DP Address:		IO Type(ID):		248 (VDTTU)	Property ID:		112		
(in the server)		Start-Index:		1	N° of elements		1		
Property access:		Read only <input checked="" type="checkbox"/>		Read/Write <input type="checkbox"/>					
Protection		Read level		-	Write level		-		
Exception Handling: Value after Power-up: Stored Value <input checked="" type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input type="checkbox"/>									

Special Features:									

3.6.6.15 Diagnostic Data ValueFreshAirDemAct

FB:	VDTTU	Property Name (Server): ValueFreshAirDemAct				Mandatory <input type="checkbox"/>	
						Optional <input checked="" type="checkbox"/>	
Description:							
Calculated value for fresh air demand.							
DPT:	Name	DPT_RelValue_Z	DPT ID	202.001	Datatype format	U ₈ Z ₈	
Field	Description			Sup.	Range	Unit	Default
Value	Calculated value for fresh air demand			M	full	%	cs
STATUS	not supported			NA			
COMMAND	not supported			NA			
Communication:							
DP Address:		IO Type(ID):		248 (VDTTU)	Property ID:		113
(in the server)		Start-Index:		1	N° of elements		1
Property access:		Read only <input checked="" type="checkbox"/>		Read/Write <input type="checkbox"/>			
Protection		Read level		-	Write level		-
Exception Handling: Value after Power-up: Stored Value <input checked="" type="checkbox"/> Act Value <input type="checkbox"/> Default Value <input type="checkbox"/>							

Special Features:							

3.7 Collection and Processing of Demand Information in LTE-HEE

3.7.1 General remark to this chapter

The following description is only thought as example how the collection and processing of the demands may be realised.

Final realisation is company specific!

3.7.2 Plug & Play mechanism in the LTE-HEE implementation:

Remark: This mechanism is only possible in LTE-HEE implementations.

In the shared variable model (e.g. S-mode) implementation all “partners” of the demand transformers have to be linked and separate Group Addresses must be assigned for each Demand input signal. The number of “partners” has to be defined at design time of the product.

3.7.3 Processing of the demand information

In LTE the demand transformers do not need to know which and how many consumers are allocated in the corresponding Distribution Segment. The demand transformer has no complete list of all controllers connected to it (no directory). Therefore adding or removing of “partners” is simple.

It is not necessary to store the demand information (data image) from **all** connected controller FB's in the demand transformer in order to calculate the resulting demand e.g. the setpoint of the corresponding medium. Due to the “heartbeat” repetition of the demand information, it is sufficient to have a dynamic process image of the N temporary “**most relevant**” demands.

Out of this dynamic data image the entries with the highest priority (demand value and attributes) are taken for the calculation of the setpoint signals for the corresponding medium.

3.7.3.1 Structure of the Main List: (proposal / example)

Main List					
Entry N°	EnergyDem	Demand-attribute: - ContrModeAct - EmergMode ^{*)}	Source FB Type and Instance	Source Individual Addr	Timeout
1					
2					
...					
N > 8					

^{*)} Ventilation demand transformer only

3.7.3.2 Criteria for a new entry in the Main List: (proposal / example)

Each received signal in the same Distribution Segment is checked whether it is relevant enough to become an entry of the list. The steps are as follows:

1. First check if there is already an entry in the list with the same sender (source individual address).
If Yes: delete the entry in the list (in the next step the new data will be entered instead)
2. Check demand attribute (ContrModeAct & EmergMode ^{*)}):

	EmergMode ^{*)} E = 0	EmergMode ^{*)} E = 1,2,3,4,5
ContrModeAct C = 0,1,2,3,4,5,7 8,9,10,12,	Demand	Demand
ContrModeAct C = 6,11,20 and all others	No Demand	Demand

^{*)} Example for Ventilation demand transformer

Information with:

No Demand are ignored and not further processed

Demand: If there is still free space in the list (void entries) the information is inserted in the list.

3. The following rules apply if the new information has **Demand** but all positions in the list are already occupied with valid data.

Signals with **EmergMode ≠ 0** are **prioritized** to any “Normal” signals (ventilation demand transformer only).

For the attributes a priority list has to be defined too.

For signals with the same priority the following applies:

Check if the new demand information is higher than any other signals in the list:

If Yes: replace the lowest value in the list.

(In the ventilation demand transformer positive and negative values have to be treated separate.)

4. If one of the entries in the main list has a timeout, the entry shall be deleted.

Out of the Main List the "**highest**" **signal** is used for transformation into the temperature setpoint.

A void entry in the list is marked as:

ContrMode = NoDem

EmergMode = Normal