

Application Descriptions

Metering

Metering E-Mode Channels

Summary

This document provides the specification of the Metering E-Mode Channels.

Version 01.00.02 is a KNX Approved Standard.

This document is part of the KNX Specifications v2.1.

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Document updates

Version	Date	Modifications
01.00.00	2013.07.16	Document creation based on AN130 "Realisation of Submetering application with tariff".
01.00.01	2013.07.18	Editorial review in view of publication.
01.00.02	2013.10.29	Editorial updates for the publication of KNX Specifications 2.1.

References

[01] Chapter 7/60/1 "Metering M-Bus Data Collector Functional Blocks"

Filename: 07_60_11 Metering E-Mode Channels v01.00.02 AS.docx

Version: 01.00.02

Status: Approved Standard

Savedate: 2013.10.29

Number of pages: 38

Contents

1	Intr	oduction	4
	1.1	Motivation	4
	1.2	Electrical metering and tariff: generalities	4
	1.3	Difference between electrical metering and Submetering	4
	1.4	Difference to Chapter 7/60/1 "Metering M-Bus Data Collector Functional	
		Blocks" ([01])	
	1.5	Consistency between energy and tariff	5
	1.6	Tariff	
	1.7	Abbreviations	7
2	E-M	Tode Channels	8
	2.1	General	8
	2.2	CH_ElectricalEnergy_Tariff_Sensor (Channel Code 0580h)	9
	2.3	CH_ElectricalEnergy_Tariff_Display (Channel Code 0581h)	11
	2.4	CH_Tariff_Sensor (Channel Code 0582h)	12
	2.5	CH_Tariff_Display (Channel Code 0583h)	13
3	Fun	ectional Blocks	14
	3.1	Application model	
	3.2	FB Electrical Energy Tariff Sensor (Object Type 1120)	
		3.2.1 Aims and objectives	
		3.2.2 Functional specification	
		3.2.3 Functional Block diagram	
		3.2.4 Datapoints	
		3.2.5 Detailed specification of the Datapoints	
	3.3	FB Electrical Energy Tariff Display (Object Type 1121)	
		3.3.1 Aims and objectives	
		3.3.2 Functional specification	26
		3.3.3 Functional Block diagram	26
		3.3.4 Datapoints	26
		3.3.5 Detailed specification of the Datapoints	28
	3.4	FB Tariff Sensor (Object Type 1122)	33
		3.4.1 Aims and objectives	33
		3.4.2 Functional specification	33
		3.4.3 Functional Block diagram	33
		3.4.4 Datapoints	33
		3.4.5 Detailed specification of the Datapoints	34
	3.5	FB Tariff Display (Object Type 1123)	36
		3.5.1 Aims and objectives	36
		3.5.2 Functional specification	36
		3.5.3 Functional Block diagram	36
		3.5.4 Datapoints	
		3.5.5 Detailed specification of the Datapoints	37

1 Introduction

1.1 Motivation

In the future, the "smart metering" subject will play an increasingly important role in the residential as well as in the commercial buildings.

One of the main reasons for that is the monitoring of the electricity consumption, in order to reduce the energy bills or optimize the distribution of energy.

1.2 Electrical metering and tariff: generalities

If the consumers are able to see their electrical consumption, and moreover when they are able to see the energy costs associated to this consumption, they are able to take the measures to reduce their consumption (turn off appliances, shift use of devices to cheaper tariff time ...).

There are also legal requirements that stipulate the use of energy meters in order to inform the customer about his consumption during the year and not having to wait for the annual energy billing.

The "smart metering", often used as a generic term for applications, must at least refer to the following needs.

- A precise measurement of electrical energy consumption.
- A support of several tariffs (defined by the energy provider).
- A clear display of the consumption.
- A repartition of the consumption on the different tariff time zones.
- A possibility to compare the consumption of a selectable interval with the one of a similar interval (day, week, month...).
- A possibility to display a partial energy consumption value that can be reset by the consumer.
- A display of the instantaneous power (for example with two modes : one with a quick refresh of data like the fuel consumption in a car, and another with a slower refresh)

The recently opened competition between electricity energy providers will surely grow the number of available tariffs, like what has been observed in the telecommunication domain.

Moreover, with the growth of renewable energies, new tariffs, dedicated to renewable energies will surely appear.

The production of domestic energies (block-unit heating and power plant, photovoltaic, wind energy...) is also in a great development.

1.3 Difference between electrical metering and Submetering

Metering

Electrical metering concerns the measurement of the total quantity of electrical energy consumed by a consumer or produced by a provider. This is done using an electrical counter (installed directly on the 230 V mains line) that is certified by standards organisation and on which the electrical energy bill is based.

Electrical meter equipment has strong legal constraints. Moreover, this equipment provides strong guarantee on the data.

M-Bus is a standard bus for the metering applications.

Submetering

Electrical Submetering concerns the measurement of energy consumption inside the electrical installation, within particular areas of the site, or used by a piece of equipment or a device. The electrical bill is not based on this information. The Submetering data are used to inform the customer about his energy consumption.

The current application only concerns the Submetering domains.

The purpose of the Submetering is to provide information for displays, with less legal constraints than for the metering equipment.

NOTE 1 It is possible to have a difference between the total amount of energy given by the metering counter and the value given by subcounter equipment that measures the energy on the main switch circuit, just behind the metering counter. This is due to the accuracy of measurement on the Submetering equipment.

1.4 Difference to Chapter 7/60/1 "Metering M-Bus Data Collector Functional Blocks" ([01])

The metering Functional Blocks existing today concern the M-Bus gateway (or Data Collector) specification, which defines the mapping of available M-Bus data to the KNX bus.

The main purpose of this specification is to access the metering data for billing applications.

The characteristics of the M-Bus specification are the following.

- Generic metering Functional Blocks (water, heat...), no electrical specific devices.
- Mostly defined for a Property Client/Server communication (reduced S-Mode Group Objects communication).
- Use of a generic metering value Datapoint.
- No use of Group Object for tariff information.
- No support of the existing energy and power Datapoint Types.
- Not dedicated to the Submetering application.

The aim of the current document is to define a set of very simple and generic Functional Blocks concerning Submetering that can model an electrical metering sensor device and the associated display.

Moreover, no E-Mode Channel is today defined concerning the electrical Submetering application.

1.5 Consistency between energy and tariff

There is no existing E-Mode Channel today that provides the energy information together with the tariff information, as needed for "smart metering" application devices (sensor, display,...). The problem is then to create one.

The first solution was to define one energy Datapoint for each supported tariff, which limits the amount of supported tariff and so is not interesting for the future. Moreover it needs a great number of Connection Codes.

Advantages	Drawbacks
	Not interesting for future Needs many Connection Codes
One transmission for each tariff	

A second solution is to use only one energy Datapoint for all possible tariffs and another Datapoint for the tariff.

Advantages	Drawbacks		
Solution interesting for the future	No guaranty of data integrity between		

Only two associations in table.	energy and tariff related to this energy, especially on RF media. Two Datapoint transmission for each tariff (growth the RF traffic) Loss of consistency Only the energy of the current active tariff can be communicated
---------------------------------	---

A third solution consists in creating a new Datapoint Type that combine both energy and tariff together.

Advantages	Drawbacks
Solution interesting for the future Only one association in table. Only one Datapoint transmission for each tariff. Guaranty of the data integrity between energy and tariff.	New Datapoint Type.

In conclusion, the third solution is the best one, taking care of the future evolution of the electrical provider market.

1.6 Tariff

The customers need to know the current tariff used by the energy provider, but need also the next tariff that will be used in order to optimize their consumption

EXAMPLE 1 Use the washing machine today instead of tomorrow when the tariff will be more expensive.

This information of the next tariff is today available in some countries through the metering counter and is already used in some non KNX products.

The solution described in this document consists in defining two Functional Blocks and two E-Mode channels that provides and consumes the following information.

- The tariff Datapoint Type.
- A Datapoint Type that combines the next tariff with the timed duration (in minutes) until the change from the current to the next tariff (like the HVAC_ModeNext Datapoint Type).

1.7 Abbreviations

Abbreviation	Description
COV	Change of Value
cs	company specific
EETD	Electrical Energy Tariff Display
EETS	Electrical Energy Tariff Sensor
FB	Functional Block
RPE	Reset Partial Energy
TAEP	Tariff Active Energy Partial
TAET	Tariff Active Energy Total
TD	Tariff Display
TDM	Timed Dynamic Mode
TN	Tariff Next
TS	Tariff Sensor

2 E-Mode Channels

2.1 General

They are fully compliant with the "Flexible E-mode Channels", as they define a set of mandatory Datapoints and parameters and some optional ones that may be defined or not in KNX products.

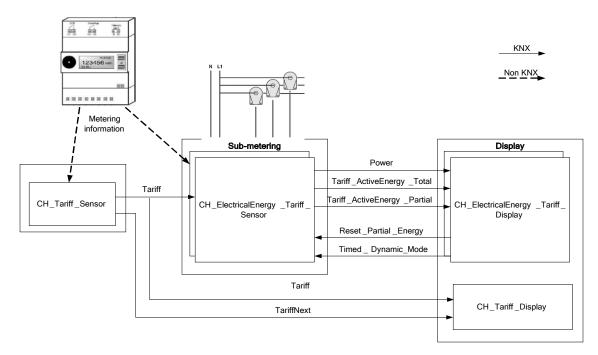


Figure 1 – Overview of the introduced E-Mode Channels

2.2 CH_ElectricalEnergy_Tariff_Sensor (Channel Code 0580h)

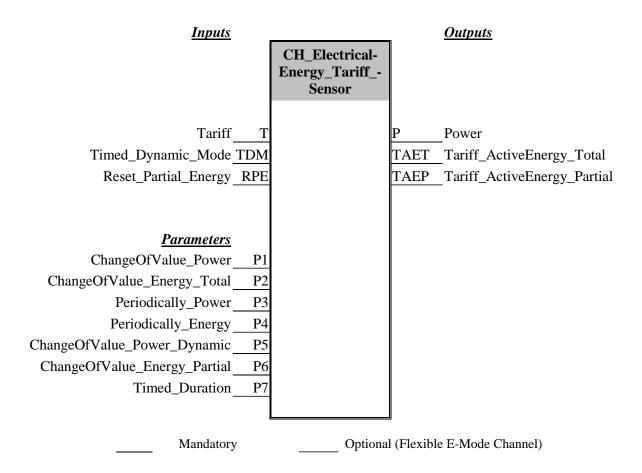
• Name: CH_ElectricalEnergy_Tariff_Sensor

<u>ID:</u> 0580hClassification: Sensor

• Functional Block:

■ 1120 - FB Electrical Energy Tariff Sensor

• **Graphical representation:**



Index	FB / Datapoint ID	Name	Sub- unit	Main CC	Additional CCs	Flags (i/o,x,v)	O/M DPT
1	EETS/T	Tariff	1	CC_Tariff (100)			M 5.006
2	EETS/P	Value_Power	1	CC_Value_Power (110)		0	M 14.056
3	EETS/ TAET	Tariff_ActiveEnergy Total	1	CC_Tariff_Active- Energy_Total (111)		0	M 235.001
4	EETS/ TDM	Timed_Dynamic_Mode	1	CC_Timed (03)		Ι	O 1.010

Index	FB / Datapoint ID	Name	Sub- unit	Main CC	Additional CCs	Flags (i/o,x,v)	O/M DPT
5	EETS/RP E	Reset_Partial_Energy	1	CC_Reset (XX)		Ι	O 1.015
6	EETS/ TAEP	Tariff_ActiveEnergy Partial	1	CC_Tariff_Active- Energy_Partial (112)		0	O 235.001

• Parameter table:

Index	Identifier	Name	Туре	Recommended default Value	Bit- Offset	O/M
1	P1	ChangeOfValue_Power	PART_COV_Power	500 W	-	М
2	P2	ChangeOfValue_Energy- Total	PART_COV_Energy	1000 Wh	-	M
3	P3	Periodically_Power	PART_Time_Delay	5 min	-	М
4	P6	Periodically_Energy	PART_Time_Delay	5 min	-	М
5	P2	ChangeOfValue_Power Dynamic	PART_COV_Power	50 W	-	0
6	P4	ChangeOfValue_Energy– Partial	PART_COV_Energy	100 Wh	-	0
7	P7	Timed_Duration	PART_Time_Delay	15 min	-	0

2.3 CH_ElectricalEnergy_Tariff_Display (Channel Code 0581h)

• Name: CH_Energy_Tariff_Display

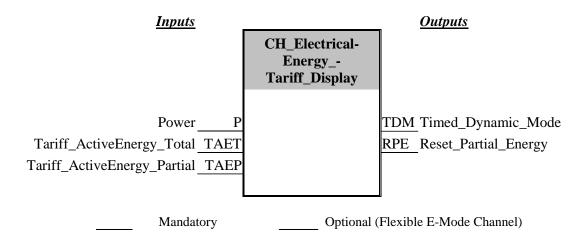
• <u>ID:</u> 0581h

• Classification: Metering

• Functional Block:

1121 - FB Electrical Energy Tariff Display

• **Graphical representation:**



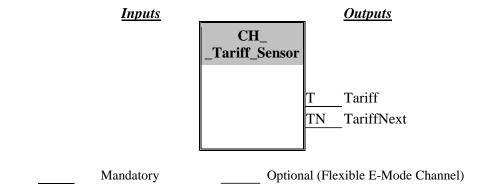
Index	FB / Datapoint ID	Name	Sub unit	Main CC	Additional CCs	Flags (i/o,x,v)	O/M DPT
1	EETD/P	Power	1	CC_Value_Power (110)		I	M 14.056
2	EETD/TAET	Tariff_Active- Energy_Total	1	CC_Tariff_Active- Energy_Total (111)		I	M 235.001
3	EETD/TAEP	Tariff_ActiveEne rgy_Partial	1	CC_Tariff_Active- Energy_Partial (112)		I	O 235.001
4	EETD/TDM	Timed_Dynamic _Mode	1	CC_Timed (03)		0	O 1.010
5	EETD/RPE	Reset_Partial Energy	1	CC_Reset (XX)		0	O 1.015

2.4 CH_Tariff_Sensor (Channel Code 0582h)

• Name: CH_Tariff_Sensor

<u>ID:</u> 0582h<u>Classification:</u> Metering

- Functional Block:
 - 1122 FB Tariff Sensor
- **Graphical representation:**



Index	FB / Datapoint ID	Name	Subunit	Main CC	Additional CCs	Flags (i/o,x,v)	O/M DPT
1	TS/T	Tariff	1	CC_Tariff (108)		0	M 5.006
2	TS/TN	TariffNext	1	CC_TariffNext (109)		0	O 225.00 3

2.5 CH_Tariff_Display (Channel Code 0583h)

• Name: CH_Tariff_Display

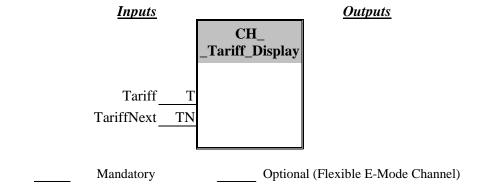
• <u>ID:</u> 0583h

• Classification: Metering

• <u>Functional Block:</u>

■ 1123 - FB Tariff Display

• Graphical representation:



Index	FB / Datapoint ID	Name	Subunit	Main CC	Additional CCs	Flags (i/o,x,v)	O/M DPT
1	TD/T	Tariff	1	CC_Tariff (108)		I	M 5.006
2	TD/TN	TariffNext	1	CC_TariffNext (109)		I	O 225.003

3 Functional Blocks

3.1 Application model

Figure 2 sketches the model of the application, combining the Functional Blocks.

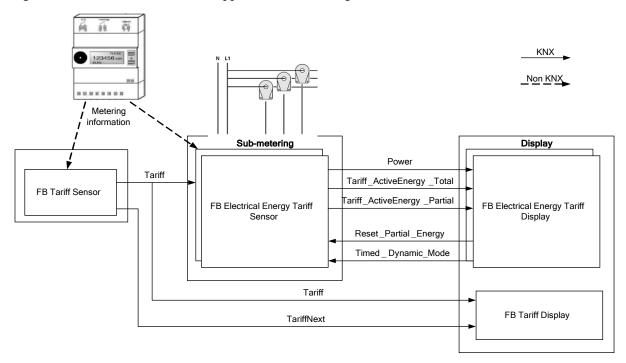


Figure 2 – Electrical submetering application model

3.2 FB Electrical Energy Tariff Sensor (Object Type 1120)

3.2.1 Aims and objectives

The FB Electrical Energy Tariff Sensor (FB EETS) shall measure the power and the energy on an electrical circuit and provide them to the KNX system.

3.2.2 Functional specification

3.2.2.1 Basic functionality

The FB EETS shall be able to measure power and energy. This Functional Block sends information to a display.

This Functional Block is foreseen for electrical energy consumption. It may also be used for electrical energy production.

Outputs

The output Datapoints of this FB shall at least contain the electrical power data (P) and the total energy data (TAET) measured by the equipment because they are considered as the minimum requirement for such a display concerning smart metering.

An optional Output may send the partial energy data (TAEP), in order to be able to give the amount of energy consumed between the last reset (the last time the RPE input Datapoint has been received) and the current time. This allows the user to see the consumption of any period of time (day, week, month...).

All these output Datapoints are sent using the corresponding Parameter values for the repetition time and the change of value.

Inputs

The input Datapoint RPE shall be used to reset the output Datapoint TAEP and so start a new time period for the measurement of energy.

The input Datapoint Timed Dynamic Mode (TDM) shall be used by a display to start a special mode that shows more dynamically the values of power (for example when the user enters a dedicated menu of the display). This is due to the existence of a special parameter called Change Of Value Dynamic Power (COVDP) that may define a smaller value than COVP in order to emit the Power output Datapoint more often when the power measures are changing. The end user may then see the evolution of the power data, refreshing the display with a higher frequency. The Dynamic mode is started for the period that is defined in the parameter Timed Duration (TD). This mode is automatically ended at the end of this period if no Start is received on the input TDM during the period. The period may be stopped using the value Stop of the input TDM. In order to stay in this dynamic mode for a period longer than defined by TD, the value Start may be sent regularly on the input Datapoint TDM.

The input Datapoint Tariff shall be used to know the current tariff used for consumption or production. This information shall be sent together with the energy data in the two output Datapoints TAET and TAEP. It is recommended to use a time-out mechanism for the Input Tariff.

As soon as a new value is received on the Tariff input Datapoint, the two outputs TAET and TAEP shall be sent using the latest measured values of energy (total and partial) for this newly received tariff.

3.2.3 Functional Block diagram

<u> </u>	B Electrical Energ	y Tariff Sensor (EET	TS) 1120
Inputs			Outputs
Tariff Tariff	(T)	(P)	Power
Гimed Dynamic Mode	(TDM)	(TAET)	Tariff Active Energy Total
Reset Partial Energy	(RPE)	(TAEP)	Tariff Active Energy Partial
ndditional I/Os			Parameters
		(COVP)	Change Of Value Power
		(COVDP)	Change Of Value Dynamic Power
		(COVET)	Change Of Value Energy Total
		(COVEP)	Change Of Value Energy Partial
		(RTP)	Repetition Time Power
		(RTE)	Repetition Time Energy
		(TD)	Timed Duration

Figure 3 – Functional Block Diagram for FB Electrical Energy Tariff Sensor

3.2.4 Datapoints

Datapoint	Abbr.	Description	Datapoint Type
Outputs			
Power	Р	Value of the measured power	14.056 DPT_Value_Power
Tariff Active Energy Total	TAET	Total value of electrical energy and tariff of this energy	235.001 DPT_Tariff_ActiveEnergy
Tariff Active Energy Partial	TAEP	Partial value of electrical energy and tariff of this energy	235.001 DPT_Tariff_ActiveEnergy

Datapoint	Abbr.	Description	Datapoint Type
Inputs			
Tariff	Т	Sets the current tariff value	5.006 DPT_Tariff
Timed Dynamic Mode	TDM	Starts or stops the Timed Dynamic Mode for a better accuracy of the visualisation of the power	1.010 DPT_Start
Reset Partial Energy	RPE	Resets all partial electrical energy values for all tariffs	1.015 DPT_Reset
Parameters			
Change Of Value Power	COVP	Change of value in W for sending the power output	14.056 DPT_Value_Power
Change Of Value Dynamic Power	COVDP	Change of value in W for sending the power output in the timed dynamic mode	14.056 DPT_Value_Power
Change Of Value Energy Total	COVET	Change of value in Wh for sending tariff active energy value total	13.010 DPT_ActiveEnergy
Change Of Value Energy Partial	COVEP	Change of value in Wh for sending tariff active energy value partial	13.010 DPT_ActiveEnergy
Repetition Time Power	RTP	Repetition time value for sending the power	7.005 DPT_TimePeriodSec
Repetition Time Energy	RTE	Repetition time value for sending the electrical energy for each tariff	7.005 DPT_TimePeriodSec
Timed Duration	TD	Timed duration of the Timed Dynamic mode for Power	7.005 DPT_TimePeriodSec

Runtime Interworking – FB Profiles for EETS

		Standard Mode
Features and options	Basic FB	EETS FB Profile 1
//Outputs		
Output P	M	GO
Output TAET	М	GO
Output TAEP	0	(GO)
Output TAEP // Inputs	0	
	O M	
// Inputs		(GO)

3.2.5 Detailed specification of the Datapoints

3.2.5.1 Output Power (P)

DP Name:	Power		Abbr.:	P	P Mandatory						\boxtimes
FB Name:	FB Electrical En	nergy Tariff Se	nsor (EE	ETS)				Can b	e internal		
Description											
If the variation measured valu current calcula	shall represent (in absolute value shall be transited value shall bynamic Mode is DPT_Value	ue) of the mea mitted on the to be transmitted active, the CC	sured pous. If the periodic	owei e po ally,	r chang wer do accord	jes more esn't cha ling to RT	than nge P.	more th	nan COVP,	then	
DPT Format:	F ₃₂	-				DPT_	ID:	1	14.056		
Field						Supp		Range	Unit	De	fault
FloatValue	The power v	alue in F ₃₂				М		Full	W	No	ne
Output											
this → M Spontaneo	us 🛭 CO\	this \rightarrow 1 /: \square	 ∆-Valu	е	COVP COVD		Min	repetit	ion time:	30	sec
	Cycl	lic 🛛	Period	:	RTP						
Request											
Communicati	7.										
Group Object I								Man	datory:	\boxtimes	
	up Address:										
Dynamics											
Power dow											
Power up:	Value:	No initialisa		<u> </u>		Default v				Щ	
		Saved value		Щ		Actual va		`		Щ	
		n bus (only for	output)	:		Read froi	m bu	ıs (only	for input):		
Exception Ha	ndling										
Special Featu	res										

3.2.5.2 Output Tariff Active Energy Total (TAET)

DP Name:	Tariff	Activ	e Ener	gy T	Total	Abbr.:	TAET		Mand	latory		
FB Name:	FB EI	ectric	al Ene	rgy	Tariff Sen	sor (EETS	3)		Can b	e interna	J	
Description												
This Datapoint this tariff.	shall	repre	sent th	e to	tal active	energy pro	oduced (i	f negative)	or consur	ned (if po	sitive) for
For the curren	t tariff											
If the variation		solute	e value) of	the energ	v for the ta	ariff chan	aes more t	han COVI	ET. then t	he ne	.w
value shall be						,,		3		,		
For the all tarif	fs, inc	luding	g the co	urrei	nt tariff							
If the energy for				ot cł	hange mo	re than CO	OVET, the	en the curr	ent value	shall be tr	ansm	nitted
periodically, ac		ng to	RTE.									
Datapoint Typ												
DPT_Name:				ctive	Energy			_				
DPT Format:	V ₃	$_2$ U $_8$ B $_8$	3					DPT_ID:		235.001		
Field								Supp.	Range	Unit	Defa	ıult
Active Electric Energy	al Th	ne tota	al elect	rical	l energy ir	า V ₃₂		М	Full	Wh	None	е
Tariff	Th	ne tari	ff curre	ently	used for	the energy	/ in U ₈	M	Full	None	None	e
Validity	Th	ne val	idity of	tarif	ff and ene	rgy data		M	Full	None	None	е
Output												
$\text{this} \to M$			t	his -	→ 1							
Spontaneo	us	\boxtimes	COV:		\boxtimes	∆-Value	COVE	T Min	repetition	period:	30 9	sec
			Cyclic	;	\boxtimes	Period:	RTE					
Request												
Communicati	on Ty	ре										
Group Object	Datap	oint							Mar	ndatory:		
Default Gro	oup Ac	dres	s: -									
Dynamics												
Power dow	n: S	Save:		\boxtimes								
Power up:	\	Value	:	No	initialisati	ion:		Default val	lue:			
				Sa	ved value	: 🛛		Actual valu	ue (not for	input):		
			mit on	bus	(only for	output):	\square	Read from	bus (only	for input)	:	
Exception Ha	ndling	3										
Special Featu												
If the Datapoin						S-Mode) a	nd the va	llue is by a	Client, the	en the en	ergy o	of the
currently valid												
If no value is re										eceived),	then	the
energy measu	red sh	iali de	ciassi	ııed	unaer "No	υ tariff" (va	iiue u tor	neia Lariff).			

3.2.5.3 Output Tariff Active Energy Partial (TAEP)

DP Name:	Tariff	Activ	e Enei	rgy F	Partial	Abbr.:	TAEP		Mano	latory		
FB Name:	FB Ele	ectric	al Ene	ergy	Tariff Sen	sor (EETS	S)		Can I	oe interna		
Description												
This Datapoint shall represent the partial active energy produced (if negative) or consumed (if positive) for this tariff. For the current tariff for the variation (in absolute value) of the energy for the tariff changes more than COVEP then the new value shall be transmitted on the bus. For the all tariffs, including the current tariff for the energy for the tariff doesn't change more than COVEP, then the current value shall be transmitted periodically, according to RTE. Moreover, this partial energy can be reset to zero value using the Input RPE.												
				n be	reset to z	zero value	using th	e Input RPI	Ξ.			
Datapoint Typ	е											
DPT_Name:	DP	T_T	ariff_A	ctive	Energy							
DPT Format:	V ₃₂	U_8B_8	3					DPT_ID:		235.001		
Field								Supp.	Range	Unit	Defa	ult
Active Electrication	al Th	e par	rtial ele	ectric	al energy	in V ₃₂		0	Full	Wh	None	е
Tariff	Th	e tari	iff curre	ently	used for	the energ	y in U ₈	0	Full	None	None	е
Validity	Th	e val	idity of	tarif	ff and ene	rgy data		0	Full	None	None	е
Output												
this $\rightarrow M$			1	this -	→ 1							
Spontaneo	us	\boxtimes	COV:		\boxtimes	∆-Value	COVE	P Min	repetition	period:	30 s	sec
			Cyclic	С	\boxtimes	Period:	RTE	•				
Request												
Communicati	on Typ	ре										
Group Object I	Datapo	oint							Mar	ndatory:		
Default Gro	up Ad	dres	s: ·									
Dynamics												
Power dow	n: S	Save:										
Power up:	\	/alue	:		initialisat			Default va				
					ved value			Actual value	· ·			
			mit on	bus	(only for	output):	\square	Read from	bus (only	for input)	:	
Exception Ha	ndling											
If the Datapoin currently valid If no value is re energy measu	t is co tariff s eceive	hall b d on	e resp the Inp	ond out D	ed. Datapoint	Tariff (and	l until a v	alid value h	nas been r		•	
						,						

3.2.5.4 Input Tariff (T)

DP I	Name:	Tar	iff			I	٩bbı	r.:	Т			М	landat	tory		
FB N	Name:	FΒ	Electrical E	nergy T	ariff Sensor (E	ETS	3)					C	an be	interna		\boxtimes
Des	cription															
This	Input sha	ll se	et or modify	the curr	rent tariff that v	vill b	e a	ssoc	iated	to t	he cu	rrently	/ mea	sured e	nerg	у.
Data	apoint Ty	ре														
DPT	_Name:	D	PT_Tariff													
DPT	Format:	U	8							DP	T_ID:	5.	.006			
Field	d	D	escription							Sup	op.	Rang	je	Unit	De	fault
Tarif	ff	Т	he tariff cur	rently us	sed (0 = no tari	ff av	/aila	ıble)		М		Full		None	nor	ne
Acc	ess Type															
Inpu	t															
N	$I \rightarrow this$			$1 \rightarrow th$	is 🛛											
S	Spontaneo	us			Cyclically:		\boxtimes				Time	-out:		31 min		
R	Request				Polling:						Perio	d:				
Con	nmunicati	ion	Туре													
Grou	up Object	Dat	apoint									Mano	datory	/: X		
	Default Gro	oup	Address:													
Dyn	amics															
P	Power dow	n:	Save:													
P	Power up:		Value:	No ir	nitialisation:				Defau	ılt va	alue:					
				Save	ed value:			(Curre	nt va	alue (not for	r in in	put):		
				on bus (only for output):		F	Read	fron	n bus	(only	for inp	out):		\boxtimes
Exc	eption Ha	ndl	ing													
Spe	cial Featu	ıres														

3.2.5.5 Input Timed Dynamic Mode (TDM)

DP Name:	Tim	imed Dynamic Mode Abbr.: TDM Mandatory											
FB Name:	FB I	Electrical En	ergy Ta	ariff Sensor	· (EET	S)				Can be	internal		
Description													
This Input sha			ng and	stopping th	e Tim	ed Dy	namic N	/lode in v	which	n the out	tput Pow	er is	
sent with a hig		frequency.											
Datapoint Ty													
DPT_Name:	DF	PT_Start											
DPT Format:	B ₁							DPT_II	_	1.010			
Field		escription						Supp.	_	ange	Unit	Defa	ault
b		shall be us						0	{0	, 1}	None	none	е
		shall be us	ed to st	tart the Time	ed Dy	namic	Mode						
Access Type													
Input													
$N \rightarrow this$			$1 \rightarrow th$	is 🛛									
Spontaneo	us			Cyclically:				Tim	ne-ou	it:	NO		
Request				Polling:				Per	iod:				
Communicat		•											
Group Object									M	andatory	/:		
Default Gr	oup /	Address:											
Dynamics													
Power dov	vn:	Save:											
Power up:		Value:		itialisation:				ult value					
				d value:			Curre	nt value	(not	for in in	put):		
			n bus (d	only for outp	put):		Read	from bu	ıs (or	nly for in	put):		
Exception Ha	ndli	ng											
Special Feat	ıres												

3.2.5.6 Input Reset Partial Energy (RPE)

DP Name:	TD	act Dorticl E	norav.		Abbr.:	ПОГ	PE	Mono	dotory	
		set Partial E				[KI	<u> </u>		datory	
FB Name:	IFB	Electrical E	nergy I	ariff Sensor (EET	IS)			Can	be interna	
Description										
		low for rese	tting all	partial energy va	ılues (o	utput T	AEP).			
Datapoint Ty										
DPT_Name:		PT_Reset								
DPT Format:	B	1					DPT_ID:	1.015	5	
Field	D	escription					Supp.	Range	Unit	Default
b	0:	shall	be igno	red			0	{0, 1}	None	none
	1:		be used	d to reset the part	tial ene	rgy				
		alues								
Access Type	е									
Input										
$N \rightarrow this$			$1 \rightarrow th$	is \square						
Spontane	ous			Cyclically:			Time	-out:	NO	
Request				Polling:			Perio	od:		
Communica	tion	Туре								
Group Objec	t Dat	apoint						Mandato	ory: 🛛	
Default G	roup	Address:								
Dynamics										
Power do	wn:	Save:								
Power up	:	Value:	No in	itialisation:		Defau	ult value:			
			Save	d value:		Curre	nt value (not for in	input):	
		Transmit	on bus (only for output):		Read	from bus	(only for	input):	
Exception H	andl	ing	Ì	, ,						
Special Feat	tures									

3.2.5.7 Parameter Change of Value Power (COVP)

FB:	EET	S	Property	Name (<u>Server</u>):		Change	of \	/alue F		Mandatory Optional				
Descri	ptior	ո։												
This re Power.	•	ents t	the minim	al change of the m	ea	suremen	t of	Powe	r that	sends a	new	valu	ie on the	Output
DPT:	Nai	me	DPT_Val	ue_Power		OPT_ID	1	4.056	Da	atatype f	orma	ıt:	F ₃₂	
Field		Des	cription		Sup.		Range	е		Unit		Resol.:	Default	
FloatV	Value 0: no COV, only heart-beat other values in range: Delta value used for resending power information					0		{0}, [1	1010	00]	W		1 W	CS
Comm	unic	atior):											
DP Ad	dress	s:		Object Type:	1	120			Prope	rty ID:		110		
(in the	serve	er)		Start-Index:	1			I	N° of	element	S	1		
Proper	ty ac	cess:		Read only] -	Read	W\k	rite	\boxtimes					
Protect	tion			Read level	-			\	Write	level		-		
Except	tion H	landl	ing: V	alue after Power-u	p:	Stored	Va	lue 🛚		Curr \	√alue		Default	Value
Specia	al Fea	ature	s:											

3.2.5.8 Parameter Change of Value Dynamic Power (COVDP)

FB:	EET	S	Property	Name (<u>Server</u>):	Char	nge d	of Valu	ie Dy	namic Pow	er		andatory otional	
Descri	ptior) :											
This represents the minimal change of the measurement of Power that sends a new value on the Output Power, in the timed dynamic mode.												Output	
DPT:	Nar	ne	DPT_Val	ue_Power	DPT_	ID	14.0	56	Datatype	forma	ıt:	F ₃₂	
Field		Des	cription			Sup).	Ran	ge	Unit		Resol.:	Default
FloatVa	alue	no C othe Delta	r values i a value us	heart-beat n range: sed for resending po dynamic mode is ac		0		{0},	[51000]	W		1 W	cs
Comm	unic	atior) :										
DP Add	dress	:		Object Type:	1120			Pi	roperty ID:		111	1	
(in the	serve	er)		Start-Index:	1			N'	° of elemen	ts	1		
Proper	ty ac	cess		Read only	- F	Read	/Write		\boxtimes				
Protect	tion			Read level	-			W	rite level				
Exception Handling: Value after Power-up: Stored Value Curr Value Default Value													
Specia	Special Features:												
			•							•		•	•

3.2.5.9 Parameter Change of Value Energy Total (COVET)

FB:	EETS	Property	Name (<u>Server</u>):	Change	of Val	lue Er	nergy	Total		Mandatory Optional		
Descri	ption:											
			nal change (in abso	olute value) of th	e mea	asuren	nent of E	nergy	Total that	sends a	
new va	lue on t	he Outputs	TAET.									
	Please note that only positive values in the range are accepted. If the absolute delta value of energy is											
	greater or equal than the current parameter value, then TAET is resent. If the absolute delta value is less than the current parameter value, TAET is not resent.											
DPT:	Name	DPT_ActiveEnergy DPT_ID 13.010 Datatype format: V ₃₂										
Field		Description	n		Sup.	Ran	ge		Unit	Resol.:	Default	
Active		other value Delta value	nly heart-beat es in range: e used for resendin energy information	•	0	{0},	[10	50 000]	Wh	1 Wh	cs	
Comm	unicatio	n:										
DP Ad	dress:		Object Type:	1120			Prope	erty ID:	1	12		
(in the	server)		Start-Index:	1			N° of	elements	1			
Proper	ty acces	s:	Read only] - Rea	d/Wri	te	\boxtimes					
Protect	tion		Read level	-			Write	level	-			
Except	Exception Handling: Value after Power-up: Stored Value 🗵 Curr Value 🔲 Default Value 🗌											
Specia	Special Features:											

3.2.5.10 Parameter Change of Value Energy Partial (COVEP)

Partial that sends a new									
ne absolute delta value of									
energy is greater or equal than the current parameter value, then TAEP is resent. If the absolute									
sent.									
tatype format: V ₃₂									
Unit Resol.: Default									
60 Wh 1 Wh cs									
/ ID: 113									
ements 1									
vel -									
Curr Value Default									
Value									
Special Features:									

3.2.5.11 Parameter Repetition Time Power (RTP)

FB:	EETS	Property	Name (Server):	Re	epetition	time Po	wer	I	Mandatory	\boxtimes	
								(Optional		
Descri	ption:										
This re	presents	the period	of emission of Pov	wer (P) when	no chai	nge of value i	s detec	ted.		
DPT:	Name	DPT_Tin	nePeriodSec	DP	T_ID	7.005	Datatype for	ormat:	U ₁₆		
Field		Descr	iption		Sup.	Range		Unit	Resol.:	Default	
Unsign	edValue	0:			0	{0}, [20	65 535]	s	1 s	cs	
			art-beat, only COV								
			values in range:								
		Else :	period in s of emiss	sion							
		of P									
Comm	unication	1:									
DP Add	dress:		Object Type:	112	20		Property ID:	1	14		
(in the	server)		Start-Index:	1			N° of element	ts 1			
Proper	ty access	•	Read only] -	Read/V	Vrite	\boxtimes				
Protection Read level -						,	Write level	-			
Exception Handling: Value after Power-up: Stored Value Curr Value Default Value											
·											
Special Features:											
In char	n channel code PART Cycle Time is used										

3.2.5.12 Parameter Repetition Time Energy (RTE)

FB:	EETS	Property	Name (<u>Server</u>):	Repetition	n time E	Energy		Mandatory			
						Opt	tional				
Descri	ption:										
This re	presents	the period	d of emission of outp	uts energy	(TAET	and TAE	P) when r	no cha	ange of v	alue is	
detecte	ed.										
DPT:	Name	DPT_Tin	nePeriodSec	DPT_ID	7.005	Data	type forma	ıt:	U ₁₆		
Field		Descript	tion		Sup.	Range	Unit	Resol.:	Default		
Unsign	edValue	0:			0	{0}, [20 .	65 535]	S	1 s	CS	
		no heart-	beat, only COV								
		other val	ues in range:								
period in s of emission of TAET and											
		TAEP									
Comm	unication	า:									
DP Add	dress:		Object Type:	1120		Property ID: 115					
(in the	server)		Start-Index:	1		N° of el	ements	1			
Proper	ty access	:	Read only	- Read	/Write	\boxtimes					
Protect	ion		Read level	-		Write le	evel	-			
Except	Exception Handling: Value after Power-up: Stored Value 🔲 Curr Value 🗌 Default Value										
			·	•							
Special Features:											
In char	nel code	PART_C	ycle_Time is used								

3.2.5.13 Parameter Timed Duration (TD)

FB:	EETS	Property	Name (<u>Server</u>):	Tir	med Dur	ation			indatory tional		
Descri	ption:										
This re	presents	the durati	on of the Timed Dyr	nami	ic Mode	where	the output Po	wer is	sen	it more fr	equently.
DPT:	Name	DPT_Tin	nePeriodSec	DP	T_ID	7.005 Datatype format:				U ₁₆	
Field		Description	on		Sup.	Range)	Unit	F	Resol.:	Default
Unsign	UnsignedValue Duration of the Timed Dynami					[30	65 535]	S	1	l s	cs
Comm	unicatio	า:									
DP Add	dress:		Object Type:	112	.0		Property ID:		116		
(in the	server)		Start-Index:	1	N° of elements			ts	1		
Proper	ty access	:	Read only	-	Read/V	Vrite	\boxtimes				
Protect	tion		Read level	-			Write level		-		
Exception Handling: Value after Power-up: Stored Value Curr Value Default Value											
Special Features:											
In char	nnel code	PART_C	ycle_Time is used								

3.3 FB Electrical Energy Tariff Display (Object Type 1121)

3.3.1 Aims and objectives

The FB Electrical Energy Tariff Display (FB EETD) shall display the power and the energy. This information may be sent by the FB Electrical Energy Tariff Sensor (FB EETS).

3.3.2 Functional specification

3.3.2.1 Basic functionality

The FB EETD shall be able to display power and energy.

The input Datapoint Power (P) shall receive the current power measured by a sensor.

The input Datapoint Tariff Active Energy Total (TAET) shall receive the consumed or produced total energy for each supported tariff. This means that this input shall be capable of supporting multiple energy registers in parallel.

The input Datapoint Tariff Active Energy Partial (TAEP) may optionally receive the consumed or produced partial energy for each supported tariff. This means that this input shall be capable of supporting multiple energy registers in parallel.

The output Datapoint Timed Dynamic Mode (TDM) may optionally be defined in order to start and stop a special mode where the Power is supposed to be received with a higher frequency.

The output Datapoint Reset Partial Energy (RPE) may optionally be defined in order to reset the Tariff Active Energy Partial of the sensor and then be able to measure energy on an interesting period (day, week, month...).

3.3.3 Functional Block diagram

FB	Electrical Energy T	Cariff Display (EETD)	1121
Inputs			Outputs
Power	(P)	Timed Dynamic Mode	(TDM)
Tariff Active Energy Total	(TAET)	Reset Partial Energy	(RPE)
Tariff Active Energy Partial	(TAEP)		
additional I/Os			Parameters
mandatory	optional		

Figure 4 – Functional Block Diagram for FB Electrical Energy Tariff Display

3.3.4 Datapoints

Datapoint	Abbr.	Description	Datapoint Type
Outputs			
Timed Dynamic Mode	TDM	Starts or stops the dynamic mode for the a better accuracy of the visualisation of the power	1.010 DPT_Start
Reset Partial Energy	RPE	Resets all partial energy values for all tariffs	1.015 DPT_Reset

Datapoint	Abbr.	Description	Datapoint Type
Inputs			
Power	Р	Value of the measured power	14.056 DPT_Value_Power
Tariff Active Energy Total	TAET	Total value of electrical energy and tariff of this energy	235.001 DPT_Tariff_ActiveEnergy
Tariff Active Energy Partial	TAEP	Partial value of electrical energy and tariff of this energy	235.001 DPT_Tariff_ActiveEnergy

Runtime Interworking – FB Profiles for EETD

		Standard Mode
Features and options	Basic FB	EETD FB Profile 1
// Outputs		
Output TDM	0	(GO)
Output RPE	0	(GO)
// Inputs		
Input P	M	GO
Input TAET	М	GO
Input TAEP	0	(GO)

3.3.5 Detailed specification of the Datapoints

3.3.5.1 Output Timed Dynamic Mode (TDM)

DP N	ame:	Tin	ned Dyn	d Dynamic Mode Abbr.: TDM Mandatory										
FB Na	ame:	FΒ	B Electrical Energy Tariff Display (EETD) Can be internal											
Desc	ription													
					ng the	Timed	Dynami	ic M	ode in whi	ch the co	rrespondin	g sensor	sen	ds
Powe	r with a b	oette	er accur	асу.										
Data	ooint Ty	ре												
DPT_	Name:		DPT_S	tart										•
DPT I	DPT Format: B ₁ DPT_ID: 1.010													
Field	ield Supp. Range Unit Default													
b														
	1: shall start or restart the Timed Dynamic Mode in the													
		ser	nsor											
Outpu	ut													
thi	this \rightarrow M \square this \rightarrow 1 \square													
Sp	Spontaneous 🖂 COV: 🔲 🗘-Value Min repetition period:													
				Cyclic	; [Period	l:						
Re	equest				<u> </u>									
Comi	municati	ion	Туре											
	o Object										Mano	datory:		
	efault Gro			s: -										
Dyna														
Po	wer dow	/n:	Save:											
Po	wer up:		Value	:	No ir	nitialisat	ion:		D	efault valu	ıe:			
					Save	ed value	:		A	ctual value	e (not for in	nput):		
	Transmit on bus (only for output): Read from bus (only for input):													
Exce	ption Ha	ndl										. /		
Spec	ial Featu	ıres												

3.3.5.2 Output Reset Partial Energy (RPE)

DP Name:	Res	et Part	ial Ene	rgy	Abbr.:	RPE		Manda	atory		
FB Name:	FB I	Electric	al Ene	rgy Tariff Dis	play (EE	TD)		Can b	e interna	ı 🛛	
Description											
This Output s	hall a	llow fo	r resett	ing all partial	energy	values (fo	r all suppo	rted tariffs)	of the linl	ked sensor.	
Datapoint Ty	ре										
DPT_Name:		PT_R	eset								
DPT Format:	E	3 ₁					DF	PT_ID: 1	.015		
Field							Supp	. Range	Unit	Default	
b	0: shall be ignored O {0, 1} None None										
1: shall reset all partial energy values											
Output											
this \rightarrow M \square this \rightarrow 1 \square											
Spontaneo	Spontaneous 🖂 COV: 🔲 🛕 -Value Min repetition period:										
			Cyclic	:	Period:		•				
Request					-	•					
Communicat	ion T	уре									
Group Object	Data	point						Man	datory:		
Default Gr	oup A	Address	s: -					-			
Dynamics											
Power dov	vn:	Save:									
Power up:		Value	:	No initialisat	tion:		Default v	alue:			
				Saved value	e: [Actual va	lue (not for	input):		
	Transmit on bus (only for output): Read from bus (only for input):										
Exception Ha	Exception Handling										
Special Feat	ures										

3.3.5.3 Input Power (P)

DP	Name:	Pov	ver				Abb	or.:	Р			N	/landat	ory		
FΒ	Name:	FΒ	Electrical E	nergy Ta	ariff Di	splay (EE	TD)					С	an be	interna	l	
De	scription															
Thi	is Input sha	ıll re	present the	physica	l powe	er measur	ed by	/ the	devic	e.						
Da	tapoint Ty	ре														
DP	T_Name:	DI	PT_Value_F	Power												
DPT Format: F ₃₂ DPT_ID: 14.056																
Fie	ld	De	escription						Sup	p.	Rang	ge	Unit	Def	ault	
Flo	atValue	Th	ne power va	lue in F	32					М		Full		W	Nor	ne
Access Type																
Inp	nput															
$N o this$ \square $1 o this$ \boxtimes																
Ī	Spontaneous										Time-	out:		NO		
Ī	Request				Pollin	g:					Perio	d:				
Со	mmunicat	ion ⁻	Туре													
Gro	oup Object	Data	apoint									Man	datory	: 🛛		
	Default Gro	oup.	Address:													
Dy	namics															
	Power dow	/n:	Save:													
	Power up:		Value:	No in	itialisa	tion:			Defau	ılt va	llue:					
					d valu				Curre	nt va	alue (r	not fo	r in inp	out):		
Transmit on bus (only for output)									Read	from	า bus	(only	for inp	out):		\boxtimes
Ex	ception Ha	ndli	ing													
Sp	ecial Featu	ıres														

3.3.5.4 Input Tariff Active Energy Total (TAET)

DP Name:	Tari	ff Active Ene	rgy To	otal	Abbr.:	TA	ÆΤ	Manda	itory			
FB Name:	FB I	Electrical End	ergy T	ariff Display (EE	TD)			Can be	e interna			
Description												
This Input sha	all rep	oresent the to	otal ac	tive energy prod	uced (if	negativ	ve) or con	sumed (if p	ositive)	for this		
tariff.												
Datapoint Ty												
DPT_Name:	_	PT_Tariff_Ac	tiveEn	ergy								
DPT Format:		₂ U ₈ B ₈					DPT_ID:			Default		
Field Description Supp. Range Unit												
Active The partial electrical energy in V_{32} M Full Wh Nor												
Electrical												
Energy English Energy E												
Tariff The tariff currently used for the energy in U_8 M Full None No												
Validity		e validity of		M	Full	None	None					
Access Type												
Input		_		1 5-7								
$N \rightarrow this$	L		$1 \rightarrow th$									
Spontaneo	ous			Cyclically:			Time		NO			
Request				Polling:			Perio	<u>d:</u>				
Communicat		-						T				
Group Object								Mandator	y: 🛛			
Default Gr	oup /	Address: -										
Dynamics												
Power dov		Save:										
Power up:		Value:	4	itialisation:			ılt value:					
				d value:			,	not for in in	<u> </u>			
Transmit on bus (only for output):												
Exception Ha	andli	ng										
Special Feat	ures											

3.3.5.5 Input Tariff Active Energy Partial (TAEP)

DP Name:	Tariff	Active En	ergy Pa	ırtial		Abbr.	:	TAEP	1	Mandatory			
FB Name:	FB EI	ectrical Er	nergy Ta	ariff Di	splay (EE	TD)				Can be	internal		
Description													
This Input sh	all repr	esent the	partial a	active	energy pro	oduced	l (if n	egative	e) or cons	umed (if	positive)	for this	
tariff.													
Datapoint T	ype												
DPT_Name:		DPT_Ta	riff_Acti	veEne	ergy								
DPT Format: $V_{32}U_8B_8$ DPT_ID: 2													
Field		Descripti							Supp.	Range	Unit	Default	
ActiveElectric Energy	cal-	The parti	ial elect	rical e	nergy in V	32			0	Full	Wh	None	
												None	
Validity		The valid	dity of ta	ariff an	d energy o	data			0	Full	None	None	
Access Typ	Access Type												
Input													
$N \rightarrow this$													
Spontane	ous	\boxtimes		Cyclic	cally:				Time-out	t:	NO		
Request				Pollin	g:				Period:				
Communica	tion Ty	ре											
Group Object	t Datap	oint							Ma	andatory			
Default G	roup Ad	ddress:											
Dynamics													
Power do	wn: S	Save:											
Power up	: \	/alue:	No in	itialisa	ition:		De	efault v	alue:				
			Save	d valu	e:		Cı	urrent v	alue (not	for in inp	out):		
	Transmit on bus (only for output): Read from bus (only for input):												
Exception H	xception Handling												
Special Feat	tures												

3.4 FB Tariff Sensor (Object Type 1122)

3.4.1 Aims and objectives

The FB Tariff Sensor (FB TS) shall provide the tariff information: the current tariff and the next one.

3.4.2 Functional specification

3.4.2.1 Basic functionality

The FB TS shall be able to provide the current tariff. This information shall be sent with a heart-beat in order to be able to have a time-out mechanism in the receiver.

Optionally, it shall also be able to provide the next tariff that will be used and the timed duration until the change to that tariff. This Datapoint is interesting for a display or a load scheduler in order to delay or advance any action that consumes energy, if the next tariff is cheaper or more expensive.

3.4.3 Functional Block diagram

	FB Tariff Sensor (TS)	1122
Inputs		Outputs
	Tariff	(T)
	Tariff Next	(TN)
	<u> </u>	
additional I/Os		Parameters
mandatory	optional	

Figure 5 - Functional Block Diagram for FB Tariff Sensor

3.4.4 Datapoints

Datapoint	Abbr.	Description	Datapoint Type
Outputs			
Tariff	Т	Sends the current tariff	5.006 DPT_Tariff
Tariff Next	TN	Sends the next tariff with the timed duration until the change	225.003 DPT_TariffNext

Runtime Interworking – FB Profiles for TS

		Standard Mode
	Basic FB	TS FB Profile 1
// Outputs		
Output T	М	GO
Output TN	0	(GO)

3.4.5 Detailed specification of the Datapoints

3.4.5.1 Output Tariff (T)

FB Name: FB Tariff Sensor (TS) Description This Output shall represent the current tariff. Datapoint Type DPT_Name: DPT_Tariff DPT Format: U ₈ DPT_ID: 5.006 Field Supp. Range Unit Default Tariff The tariff currently used (0 = no tariff available) M Full None none Output this → M	DF	Name:	Tari	ff			Abbr.:	1	Γ			Manda	Mandatory 🖂			
This Output shall represent the current tariff. Datapoint Type	FB	Name:	FB	Tariff S	Sensc	or (TS)						Can be	e interna			
Datapoint Type DPT_Name: DPT_Tariff DPT Format: U ₈ Field Supp. Range Unit Default Tariff The tariff currently used (0 = no tariff available) M Full None none Output this → M Image: Spontaneous of this image: Spontaneous of thi	De	scription														
DPT_Name: DPT_Tariff DPT Format: U ₈	Th	is Output sh	nall r	eprese	nt th	e current tariff.										
$ \begin{array}{ c c c c c }\hline DPT Format: & U_8 & DPT_ID: & 5.006 \\\hline Field & Supp. & Range & Unit & Default \\\hline Tariff & The tariff currently used (0 = no tariff available) & M & Full & None & none \\\hline \\\hline Output & this \rightarrow M & M & this \rightarrow 1 & Mone & Min repetition period: & 15 min \\\hline Spontaneous & COV: & A-Value & Min repetition period: & 15 min \\\hline & Cyclic & Period: & Period: & Mandatory: & Man$	Da	tapoint Typ	ре													
Field Supp. Range Unit Default Tariff The tariff currently used (0 = no tariff available) M Full None none Output this → M ✓ this → 1 ✓ Min repetition period: 15 min Spontaneous ✓ COV: ✓ A-Value Min repetition period: 15 min Request ✓ Period: Mandatory: ✓ Communication Type Group Object Datapoint Mandatory: ✓ Default Group Address: Power down: Save: ✓ Power up: Value: No initialisation: ✓ Default value: ✓ Power up: Value: No initialisation: ✓ Actual value (not for input): ✓ Transmit on bus (only for output): ✓ Read from bus (only for input): ✓ Exception Handling Actual value	DF	PT_Name:		PT_T	ariff											
Tariff The tariff currently used (0 = no tariff available) M Full None none Output this → M	DF															
Output this → M	Fie	eld									Supp.	Range	Unit	Default		
this → M	Ta	riff	Т	he tar	iff cu	rrently used (0	= no tai	riff a	available	(М	Full	None	none		
this → M																
Spontaneous	Ö	Output														
Request Communication Type Group Object Datapoint		$this \to M$		3		this \rightarrow 1										
Request Communication Type Group Object Datapoint	Spontaneous ⊠ COV: □ ∆-Value										Min r	epetition	period:	15 min		
Communication Type Group Object Datapoint					Сус	lic 🛛	Period				-					
Group Object Datapoint		Request		\square												
Default Group Address: Dynamics Power down: Save: Power up: Value: No initialisation: Default value: Saved value: Actual value (not for input): Transmit on bus (only for output): Read from bus (only for input): Exception Handling	Co	mmunicati	ion 1	Гуре												
Dynamics Power down: Save: Power up: Value: No initialisation: Default value: Saved value: Actual value (not for input): ✓ Transmit on bus (only for output): Read from bus (only for input): □ Exception Handling	Gr	oup Object	Data	point								Mand	datory:			
Power down: Save: Power up: Value: No initialisation: Default value: Saved value: Actual value (not for input): Transmit on bus (only for output): Read from bus (only for input): Exception Handling		Default Gro	oup /	Addres	s:							•				
Power up: Value: No initialisation: Default value: Saved value: Actual value (not for input): Transmit on bus (only for output): Read from bus (only for input): Exception Handling	Dy	namics														
Saved value: Actual value (not for input): Transmit on bus (only for output): Read from bus (only for input): Exception Handling		Power dow	/n:	Save:	1											
Transmit on bus (only for output): Read from bus (only for input): Exception Handling		Power up:		Value	:	No initialisat	ion:			Defa	ult value:					
Exception Handling						Saved value	: :		,	Actu	al value (not for in	out):	\boxtimes		
				Trans	mit c	n bus (only for	output)	:		Read	d from bu	s (only fo	r input):			
Special Features	Ex	xception Handling														
Special Features	i															
	Sp	ecial Featu	ıres													
							•									

3.4.5.2 Output Tariff Next (TN)

DP I	Name:	Tar	iff Ne	ext				Abbr.:	-	TN			Mandator	у			
FB N	Name:	FB	Tarif	ff S	ensor	(TS)							Can be in	ternal			
Des	cription																
This	Output s	hall ı	epre	ese	nt the	next ta	ariff witl	h the tin	ned	duratio	n until tl	ne chan	ge.				
Data	apoint Ty	/pe															
DPT	_Name:		DPT.	_Ta	ariffNe	xt											
DPT	DPT Format: U ₁₆ U ₈ DPT_ID: 225.003																
Field Supp. Range Unit Defa											ault						
Tarif	ff	The	next	ac	tive Ta	ariff aft	er expi	ration o	f the	edelay	time.	М	Full	None	· N	Non	е
Dela	ay time	Dela	y tim	ne u	until ne	ext cha	ange of	tariff				M	Full	min	١	Non	е
Outp	out																
tl	this \rightarrow M \square this \rightarrow 1 \square																
0)	Spontane	ous 🛛 COV: 🔲 Δ-Value										Min repe	etition peri	od:			
					Cyclic	; [Period	:								
	Request																
Con	nmunica	tion	Туре)													
Gro	up Object	t Data	apoir	nt									Mandato	ory:			
	Default G	roup	Addr	res	s: -												
_	amics																
F	Power do	wn:	Sa														
F	Power up:		Val	lue	:		itialisat				Default	value:					
							d value				Actual	value (n	ot for inpu	ut):	\boxtimes		
	Transmit on bus (only for output): Read from bus (only for input):																
Exc	eption H	andli	ing														
Spe	cial Feat	ures															

3.5 FB Tariff Display (Object Type 1123)

3.5.1 Aims and objectives

The FB Tariff Display (FB TD) shall display the tariff information: the current tariff and the next one.

3.5.2 Functional specification

3.5.2.1 Basic functionality

The FB TS shall be able to display the current tariff. It is recommended to use a time-out mechanism for the Input Tariff.

Optionally, it shall also be able to display the next tariff that will be used and the timed duration until the change to that tariff.

3.5.3 Functional Block diagram

	FB Tariff Display (TD)	1123
Inputs		Outputs
Tariff	(T)	
Tariff Next	(TN)	
additional I/Os		Parameters
	•	
mandatory	optional	

Figure 6 – Functional Block Diagram for FB Tariff Sensor

3.5.4 Datapoints

Datapoint	Abbr.	Description	Datapoint Type
Inputs			
Tariff	Т	Sends the current tariff	5.006 DPT_Tariff
Tariff Next	TN	Sends the next tariff with the timed duration until the change	225.003 DPT_TariffNext

Runtime Interworking – FB Profiles for TD

		Standard Mode
Features and options	Basic FB	TS FB Profile 1
// Inputs		
Input T	М	GO
Input TN	0	(GO)

3.5.5 Detailed specification of the Datapoints

3.5.5.1 Input Tariff (**T**)

DF	Name:	Tai	riff				Αŀ	bbr.:		Т				Manda	tory		\boxtimes
FΒ	Name:	FΒ	Tariff Displ	ay (TD)										Can be	internal		
De	scription																
Th	is Input sha	ll re	epresent the	current	tariff.												
Da	tapoint Ty	ре															
	PT_Name:	D	PT_Tariff														
DPT Format: U ₈ DPT_ID: 5.006																	
												Def	ault				
Tariff The tariff currently used (0 = no tariff av											М		Fu	II	None	non	е
Ac	cess Type																
Inp	out																
	$N \rightarrow \text{this}$ \square $1 \rightarrow \text{this}$ \square Spontaneous \square Cyclically: \square Time-out: 31 min																
	Spontaneous											Time	-out	:	31 min		
	Request				Pollir	ng:						Perio	d:				
Ö	mmunicati	ion	Туре														
Gr	oup Object	Dat	tapoint										Ma	ndatory	/:		
	Default Gro	oup	Address:														
Dy	namics																
	Power dow	/n:	Save:														
	Power up:		Value:	No in	itialisa	ation:			De	efau	ılt va	alue:					
				Save	d valu	ıe:			Cı	urre	nt v	alue (ı	not	for in in	put):		
Transmit on bus (only for output)									Re	ead	fror	n bus	(on	ly for in	put):		\boxtimes
Ex	ception Ha	ınd	ling														
i																	
Sp	ecial Featu	ıres	3														
ŀ																	

3.5.5.2 Input Tariff Next (TN)

DP Nam	ne:	Tariff Next						Abbr.: TN			M	Mandatory [
FB Nam	ne:	FB T	ariff Displa						Can be internal								
Descrip																	
This Input shall represent the next tariff with the timed duration until the change.																	
Datapoint Type																	
DPT_Na	ame:	DP	DPT_TariffNext														
DPT Fo	rmat:	U ₁₆	$U_{16}U_{8}$								DPT_ID: 225.003						
Field		De	Description								Rang	ge	Unit	Default			
Tariff			The next active Tariff after expiration of the delay time								Full		None	None			
Delay tir	me	De	lay time un			М		Full		min	None						
Access Type																	
Input																	
$N \rightarrow$	this	\boxtimes	\square 1 \rightarrow this \square														
Spor	ntaneo	JS	\boxtimes	Cyclically:					Time-ou			t: NO					
Requ	uest					Polling:				Period:							
Communication Type																	
Group C	Object [Data	atapoint					Mandatory:									
Default Group Address:																	
Dynamics																	
Powe	Power down		Save:	ve:													
Powe	Power up:		Value: No initialisation:				Default value:										
				Saved value:		e:		Current value (not for i				r in inp	out):				
		Transmit on bus (only for output):						Re	ad from bus (only for input):								
Exception Handling																	
Special Features																	