KNX communication protocol

User manual

1MNUPRKNX001

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KNX communication protocol

for KNX modules

September edition 2015

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1. DATAPOINT TYPES

Here follows all the Datapoint Types (DPT) used by KNX communication module.

DPT	Name	Unit / Range	Format	Resolution
5.010	DPT_Value_1_Ucount	0 ... 255	U8	1 count
8.001	DPT_Value_2_Count	-32768 ... 32767	V16	1 pulses
14.019	DPT_Value_Electric_Current	A	F32	1 A
14.028	DPT_Electric_PotentialDifference	V	F32	1 V
14.033	DPT_Value_Angular_Frequency	Hz	F32	1 Hz
14.056	DPT_Value_Power	± ≈10-44.85 ... ≈1038.53 W	F32	1 W
16.000	DPT_String_ASCII	-	A14	-
29.010	DPT_ActiveEnergy_V64	-9223372036854775808 ... 9223372036854775808 Wh	V64	1 Wh
29.011	DPT_ApparantEnergy_V64	-9223372036854775808 ... 9223372036854775808 VAh	V64	1 VAh
29.012	DPT_ReactiveEnergy_V64	-9223372036854775808 ... 9223372036854775808 varh	V64	1 varh
217.001	DPT_Version	0 ... 31, 0 ... 31, 0 ... 63	U5U5U6	-
-	Custom 1 byte	00000000 ... 11111111	B8	-
-	Custom 2 byte	0000000000000000 ... 1111111111111111	B16	-

Table 1.1 – Datapoint types used by KNX communication module

2. PARAMETERS TO BE PRESET

The specific parameters and addresses can be assigned and transferred to the bus device by ETS (Engineering Tool Software).

2.1 Energy counter selection

At first time, it is important to preset the energy counter model.

Parameter name	Possible selection
Model	3 Phase 4 Wires, 3 Phase 3 Wires, 1 Phase

Table 2.1.1 – Energy counter selection

2.2 Sending mode

It is important to preset the sending mode of communication objects.
Different sending modes are available:

- Cyclic
- Variation
- OnDemand

Cyclic: the object is transmitted cyclically at a preset time interval. Every object set in Cyclic mode cannot be transmitted in Variation mode too.

Variation: the object is transmitted when the difference between the present measurement and the last measured value overcome a preset threshold. A different threshold is defined for voltage, current, frequency, active/apparent/reactive powers, active/apparent/reactive energies. Every object set in Variation mode cannot be transmitted in Cyclic mode too.

OnDemand: an object is transmitted when requested. In case of measurement request (e.g. phase voltage) a group of defined parameters is transmitted (phase voltage, line voltage, current, ...). Every object can be transmitted OnDemand even if preset as Cyclic or Variation mode.

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According to the sending mode to be used for each object, carry out the programming following the tables here below.

WIRING MODE LEGEND:

3.4.3 → 3 phase, 4 wires, 3 currents
3.3.3 → 3 phase, 3 wires, 3 currents
3.3.2 → 3 phase, 3 wires, 2 currents
1ph → single phase

PRESET TIME FOR CYCLIC MODE

Parameter name	Unit	Value range
Cyclic time	s	1...60000 ms

Table 2.2.1 – Preset time for Cyclic mode

THRESHOLDS FOR VARIATION MODE

Parameter name	Unit	Value range
Voltage variation	V	0...65535 mV
Current variation	A	0...65535 mA
Power factor variation	-	0...1000 m
Frequency variation	Hz	0...255 (x 0.01 Hz)
Active power variation	W	0...65535 W
Apparent power variation	VA	0...65535 VA
Reactive power variation	var	0...65535 var
Active energy variation	kWh	0...65535 Wh
Apparent energy variation	kVAh	0...65535 VAh
Reactive energy variation	kvarh	0...65535 varh

Table 2.2.2 – Thresholds according to the parameter for Variation mode

SENDING MODE FOR REALTIME VALUES

Parameter name	Possible selection	Wiring modes		
		3.4.3	3.3.2 3.3.3	1ph
Phase 1 voltage	OnDemand & Variation / Cyclic	X		
Phase 2 voltage	OnDemand & Variation / Cyclic	X		
Phase 3 voltage	OnDemand & Variation / Cyclic	X		
Line 12 voltage	OnDemand & Variation / Cyclic	X	X	
Line 23 voltage	OnDemand & Variation / Cyclic	X	X	
Line 31 voltage	OnDemand & Variation / Cyclic	X	X	
System voltage	OnDemand & Variation / Cyclic	X	X	X
Phase 1 current	OnDemand & Variation / Cyclic	X	X	
Phase 2 current	OnDemand & Variation / Cyclic	X	X	
Phase 3 current	OnDemand & Variation / Cyclic	X	X	
Neutral current	OnDemand & Variation / Cyclic	X		
System current	OnDemand & Variation / Cyclic	X	X	X
Phase 1 power factor	OnDemand & Variation / Cyclic	X		
Phase 2 power factor	OnDemand & Variation / Cyclic	X		
Phase 3 power factor	OnDemand & Variation / Cyclic	X		
System power factor	OnDemand & Variation / Cyclic	X	X	X
Phase 1 active power	OnDemand & Variation / Cyclic	X		
Phase 2 active power	OnDemand & Variation / Cyclic	X		
Phase 3 active power	OnDemand & Variation / Cyclic	X		
System active power	OnDemand & Variation / Cyclic	X	X	X
Phase 1 apparent power	OnDemand & Variation / Cyclic	X		
Phase 2 apparent power	OnDemand & Variation / Cyclic	X		
Phase 3 apparent power	OnDemand & Variation / Cyclic	X		

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Parameter name	Possible selection	Wiring modes		
		3.4.3	3.3.2 3.3.3	1ph
System apparent power	OnDemand & Variation / Cyclic	X	X	X
Phase 1 reactive power	OnDemand & Variation / Cyclic	X		
Phase 2 reactive power	OnDemand & Variation / Cyclic	X		
Phase 3 reactive power	OnDemand & Variation / Cyclic	X		
System reactive power	OnDemand & Variation / Cyclic	X	X	X
Frequency	OnDemand & Variation / Cyclic	X	X	X

Table 2.2.3 – Realtime values

SENDING MODE FOR TOTAL COUNTERS

Parameter name	Possible selection	Wiring modes		
		3.4.3	3.3.2 3.3.3	1ph
System imported active energy	OnDemand & Variation / Cyclic	X	X	X
System exported active energy	OnDemand & Variation / Cyclic	X	X	X
System imported ind. apparent energy	OnDemand & Variation / Cyclic	X	X	X
System exported ind. apparent energy	OnDemand & Variation / Cyclic	X	X	X
System imported cap. apparent energy	OnDemand & Variation / Cyclic	X	X	X
System exported cap. apparent energy	OnDemand & Variation / Cyclic	X	X	X
System imported ind. reactive energy	OnDemand & Variation / Cyclic	X	X	X
System exported ind. reactive energy	OnDemand & Variation / Cyclic	X	X	X
System imported cap. reactive energy	OnDemand & Variation / Cyclic	X	X	X
System exported cap. reactive energy	OnDemand & Variation / Cyclic	X	X	X

Table 2.2.4 – Total counters

SENDING MODE FOR TARIFF 1 COUNTERS

Parameter name	Possible selection	Wiring modes		
		3.4.3	3.3.2 3.3.3	1ph
Phase 1 imported active energy - Tariff 1	OnDemand & Variation / Cyclic	X		
Phase 2 imported active energy - Tariff 1	OnDemand & Variation / Cyclic	X		
Phase 3 imported active energy - Tariff 1	OnDemand & Variation / Cyclic	X		
System imported active energy - Tariff 1	OnDemand & Variation / Cyclic	X	X	X
Phase 1 exported active energy - Tariff 1	OnDemand & Variation / Cyclic	X		
Phase 2 exported active energy - Tariff 1	OnDemand & Variation / Cyclic	X		
Phase 3 exported active energy - Tariff 1	OnDemand & Variation / Cyclic	X		
System exported active energy - Tariff 1	OnDemand & Variation / Cyclic	X	X	X
Phase 1 imported inductive apparent energy - Tariff 1	OnDemand & Variation / Cyclic	X		
Phase 2 imported inductive apparent energy - Tariff 1	OnDemand & Variation / Cyclic	X		
Phase 3 imported inductive apparent energy - Tariff 1	OnDemand & Variation / Cyclic	X		
System imported inductive apparent energy - Tariff 1	OnDemand & Variation / Cyclic	X	X	X
Phase 1 exported inductive apparent energy - Tariff 1	OnDemand & Variation / Cyclic	X		
Phase 2 exported inductive apparent energy - Tariff 1	OnDemand & Variation / Cyclic	X		
Phase 3 exported inductive apparent energy - Tariff 1	OnDemand & Variation / Cyclic	X		
System exported inductive apparent energy - Tariff 1	OnDemand & Variation / Cyclic	X	X	X
Phase 1 imported capacitive apparent energy - Tariff 1	OnDemand & Variation / Cyclic	X		
Phase 2 imported capacitive apparent energy - Tariff 1	OnDemand & Variation / Cyclic	X		
Phase 3 imported capacitive apparent energy - Tariff 1	OnDemand & Variation / Cyclic	X		
System imported capacitive apparent energy - Tariff 1	OnDemand & Variation / Cyclic	X	X	X

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Parameter name	Possible selection	Wiring modes		
		3.4.3	3.3.2 3.3.3	1ph
Phase 1 exported capacitive apparent energy - Tariff 1	OnDemand & Variation / Cyclic	X		
Phase 2 exported capacitive apparent energy - Tariff 1	OnDemand & Variation / Cyclic	X		
Phase 3 exported capacitive apparent energy - Tariff 1	OnDemand & Variation / Cyclic	X		
System exported capacitive apparent energy - Tariff 1	OnDemand & Variation / Cyclic	X	X	X
Phase 1 imported inductive reactive energy - Tariff 1	OnDemand & Variation / Cyclic	X		
Phase 2 imported inductive reactive energy - Tariff 1	OnDemand & Variation / Cyclic	X		
Phase 3 imported inductive reactive energy - Tariff 1	OnDemand & Variation / Cyclic	X		
System imported inductive reactive energy - Tariff 1	OnDemand & Variation / Cyclic	X	X	X
Phase 1 exported inductive reactive energy - Tariff 1	OnDemand & Variation / Cyclic	X		
Phase 2 exported inductive reactive energy - Tariff 1	OnDemand & Variation / Cyclic	X		
Phase 3 exported inductive reactive energy - Tariff 1	OnDemand & Variation / Cyclic	X		
System exported inductive reactive energy - Tariff 1	OnDemand & Variation / Cyclic	X	X	X
Phase 1 imported capacitive reactive energy - Tariff 1	OnDemand & Variation / Cyclic	X		
Phase 2 imported capacitive reactive energy - Tariff 1	OnDemand & Variation / Cyclic	X		
Phase 3 imported capacitive reactive energy - Tariff 1	OnDemand & Variation / Cyclic	X		
System imported capacitive reactive energy - Tariff 1	OnDemand & Variation / Cyclic	X	X	X
Phase 1 exported capacitive reactive energy - Tariff 1	OnDemand & Variation / Cyclic	X		
Phase 2 exported capacitive reactive energy - Tariff 1	OnDemand & Variation / Cyclic	X		
Phase 3 exported capacitive reactive energy - Tariff 1	OnDemand & Variation / Cyclic	X		
System exported capacitive reactive energy - Tariff 1	OnDemand & Variation / Cyclic	X	X	X

Table 2.2.5– Tariff 1 counters (T1)

SENDING MODE FOR TARIFF 2 COUNTERS

Parameter name	Possible selection	Wiring modes		
		3.4.3	3.3.2 3.3.3	1ph
Phase 1 imported active energy - Tariff 2	OnDemand & Variation / Cyclic	X		
Phase 2 imported active energy - Tariff 2	OnDemand & Variation / Cyclic	X		
Phase 3 imported active energy - Tariff 2	OnDemand & Variation / Cyclic	X		
System imported active energy - Tariff 2	OnDemand & Variation / Cyclic	X	X	X
Phase 1 exported active energy - Tariff 2	OnDemand & Variation / Cyclic	X		
Phase 2 exported active energy - Tariff 2	OnDemand & Variation / Cyclic	X		
Phase 3 exported active energy - Tariff 2	OnDemand & Variation / Cyclic	X		
System exported active energy - Tariff 2	OnDemand & Variation / Cyclic	X	X	X
Phase 1 imported inductive apparent energy - Tariff 2	OnDemand & Variation / Cyclic	X		
Phase 2 imported inductive apparent energy - Tariff 2	OnDemand & Variation / Cyclic	X		
Phase 3 imported inductive apparent energy - Tariff 2	OnDemand & Variation / Cyclic	X		
System imported inductive apparent energy - Tariff 2	OnDemand & Variation / Cyclic	X	X	X
Phase 1 exported inductive apparent energy - Tariff 2	OnDemand & Variation / Cyclic	X		
Phase 2 exported inductive apparent energy - Tariff 2	OnDemand & Variation / Cyclic	X		
Phase 3 exported inductive apparent energy - Tariff 2	OnDemand & Variation / Cyclic	X		
System exported inductive apparent energy - Tariff 2	OnDemand & Variation / Cyclic	X	X	X
Phase 1 imported capacitive apparent energy - Tariff 2	OnDemand & Variation / Cyclic	X		
Phase 2 imported capacitive apparent energy - Tariff 2	OnDemand & Variation / Cyclic	X		
Phase 3 imported capacitive apparent energy - Tariff 2	OnDemand & Variation / Cyclic	X		
System imported capacitive apparent energy - Tariff 2	OnDemand & Variation / Cyclic	X	X	X
Phase 1 exported capacitive apparent energy - Tariff 2	OnDemand & Variation / Cyclic	X		
Phase 2 exported capacitive apparent energy - Tariff 2	OnDemand & Variation / Cyclic	X		

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Parameter name	Possible selection	Wiring modes		
		3.4.3	3.3.2 3.3.3	1ph
Phase 3 exported capacitive apparent energy - Tariff 2	OnDemand & Variation / Cyclic	X		
System exported capacitive apparent energy - Tariff 2	OnDemand & Variation / Cyclic	X	X	X
Phase 1 imported inductive reactive energy - Tariff 2	OnDemand & Variation / Cyclic	X		
Phase 2 imported inductive reactive energy - Tariff 2	OnDemand & Variation / Cyclic	X		
Phase 3 imported inductive reactive energy - Tariff 2	OnDemand & Variation / Cyclic	X		
System imported inductive reactive energy - Tariff 2	OnDemand & Variation / Cyclic	X	X	X
Phase 1 exported inductive reactive energy - Tariff 2	OnDemand & Variation / Cyclic	X		
Phase 2 exported inductive reactive energy - Tariff 2	OnDemand & Variation / Cyclic	X		
Phase 3 exported inductive reactive energy - Tariff 2	OnDemand & Variation / Cyclic	X		
System exported inductive reactive energy - Tariff 2	OnDemand & Variation / Cyclic	X	X	X
Phase 1 imported capacitive reactive energy - Tariff 2	OnDemand & Variation / Cyclic	X		
Phase 2 imported capacitive reactive energy - Tariff 2	OnDemand & Variation / Cyclic	X		
Phase 3 imported capacitive reactive energy - Tariff 2	OnDemand & Variation / Cyclic	X		
System imported capacitive reactive energy - Tariff 2	OnDemand & Variation / Cyclic	X	X	X
Phase 1 exported capacitive reactive energy - Tariff 2	OnDemand & Variation / Cyclic	X		
Phase 2 exported capacitive reactive energy - Tariff 2	OnDemand & Variation / Cyclic	X		
Phase 3 exported capacitive reactive energy - Tariff 2	OnDemand & Variation / Cyclic	X		
System exported capacitive reactive energy - Tariff 2	OnDemand & Variation / Cyclic	X	X	X

Table 2.2.6 – Tariff 2 counters (T2)

SENDING MODE FOR PARTIAL COUNTERS

Parameter name	Possible selection	Wiring modes		
		3.4.3	3.3.2 3.3.3	1ph
System imported active energy - Partial counter	OnDemand & Variation / Cyclic	X	X	X
System exported active energy - Partial counter	OnDemand & Variation / Cyclic	X	X	X
System imported ind. apparent energy - Partial counter	OnDemand & Variation / Cyclic	X	X	X
System exported ind. apparent energy - Partial counter	OnDemand & Variation / Cyclic	X	X	X
System imported cap. apparent energy - Partial counter	OnDemand & Variation / Cyclic	X	X	X
System exported cap. apparent energy - Partial counter	OnDemand & Variation / Cyclic	X	X	X
System imported ind. reactive energy - Partial counter	OnDemand & Variation / Cyclic	X	X	X
System exported ind. reactive energy - Partial counter	OnDemand & Variation / Cyclic	X	X	X
System imported cap. reactive energy - Partial counter	OnDemand & Variation / Cyclic	X	X	X
System exported cap. reactive energy - Partial counter	OnDemand & Variation / Cyclic	X	X	X

Table 2.2.7 - Partial counters

SENDING MODE FOR BALANCE COUNTERS

Parameter name	Possible selection	Wiring modes		
		3.4.3	3.3.2 3.3.3	1ph
System active energy - Balance counter	OnDemand & Variation / Cyclic	X	X	X
System inductive apparent energy - Balance counter	OnDemand & Variation / Cyclic	X	X	X
System capacitive apparent energy - Balance counter	OnDemand & Variation / Cyclic	X	X	X
System inductive reactive energy - Balance counter	OnDemand & Variation / Cyclic	X	X	X
System capacitive reactive energy - Balance counter	OnDemand & Variation / Cyclic	X	X	X

Table 2.2.8 – Balance counters

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3. ONDEMAND COMMUNICATION OBJECTS

In this chapter, all the communication object can be read OnDemand.

FLAG LEGEND:

C → Communication R → Read W → Write T → Transmission

English

3.1 Info on the KNX module

Obj.	Communication object name	Format	DPT	Flag	Response structure
146	KNX firmware release	U5U5U6	217.001	C,R,T	
147	KNX hardware release	U5U5U6	217.001	C,R,T	
148	KNX serial number	A14	16.000	C,R,T	
149	Reserved				
150	Reserved				
151	Reserved				

Table 3.1.1 – Info on the KNX module

These communication objects can be read directly.

3.2 Info&status on the combined energy counter

Obj.	Communication object name	Format	DPT	Flag	Response structure
134	Serial number	A14	16.000	C,R,T	
135	Model	N8	NO STD	C,R,T	
136	Type	N8	NO STD	C,R,T	00=no MID+Reset, 01=no MID, 02=MID, 03=no MID+Wiring, 04=no MID+Wiring+Profiles, 05=MID+no varh, 06=no MID+Profiles, 07=MID+Wiring+Profiles, 08=MID+Profiles, 09=MID+Wiring, 10=MID+Wiring+no varh, 11=no MID+Reset+Wiring
137	Firmware release 1	A14	16.000	C,R,T	
138	Firmware release 2	A14	16.000	C,R,T	
139	Hardware release	A14	16.000	C,R,T	
140	Reserved				
141	CT value	U16	NO STD	C,R,T	
142	Full scale value (FSA)	F32	14.019	C,R,T	
143	Wiring mode	N8	NO STD	C,R,T	1=3 phases, 4 wires, 3 CTs 2=3 phases, 3 wires, 2 CTs 3=1 phase 4=3 phases, 3 wires, 3 CTs
144	Primary/secondary values	N1	NO STD	C,R,T	0=primary values, 1=secondary values
145	Error Code	N8	NO STD	C,R,T	
152	Voltage alarm status	N2N2N2 N2N2N2 B1B1	NO STD	C,R,T	2 Bytes encoded: V3|V2|V1|V∑|V23|V31|V12|PhOrd|IR|
153	Current alarm status	B1B1N2 N2N2N2	NO STD	C,R,T	2 Bytes encoded: T|F|ND|ND|ND|ND|IN|I3|I2|I1|I∑|
154	Partial counter status	B16	NO STD	C,R,T	2 Bytes encoded: ND|ND|ND|ND|ND|ND|-kvarh∑-C-PAR| +kvarh∑-C-PAR|-kvarh∑-L-PAR|+kvarh∑-L-PAR| -kVAh∑-C-PAR|+kVAh∑-C-PAR|-kVAh∑-L-PAR| +kVAh∑-L-PAR|-kWh∑-PAR|+kWh∑-PAR|

Table 3.2.1 – Info&status on the combined energy counter

N.B.: For alarm status (obj. 152, 153) the bit in the response has the following meaning: 00_b=no alarm, 01_b=low threshold alarm, 10_b=high threshold alarm

N.B.: Firmware release 2 is available only with the latest energy counter models.

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These communication objects can be read directly.

NOTE

When the value of the communication object 134, 143, 144, 151, 152, 153 changes, the new value is spontaneously sent by the KNX communication module.

LEGEND FOR ALARM&STATUS:

SYMBOL	MEANING
LV1	Phase 1 voltage - LOW threshold alarm
LV2	Phase 2 voltage - LOW threshold alarm
LV3	Phase 3 voltage - LOW threshold alarm
LV12	Line 12 voltage - LOW threshold alarm
LV23	Line 23 voltage - LOW threshold alarm
LV31	Line 31 voltage - LOW threshold alarm
LV∑	System voltage - LOW threshold alarm
LI1	Phase 1 current - LOW threshold alarm
LI2	Phase 2 current - LOW threshold alarm
LI3	Phase 3 current - LOW threshold alarm
LIN	Neutral current - LOW threshold alarm
LI∑	System current - LOW threshold alarm
HV1	Phase 1 voltage - HIGH threshold alarm
HV2	Phase 2 voltage - HIGH threshold alarm
HV3	Phase 3 voltage - HIGH threshold alarm
HV12	Line 12 voltage - HIGH threshold alarm
HV23	Line 23 voltage - HIGH threshold alarm
HV31	Line 31 voltage - HIGH threshold alarm
HV∑	System voltage - HIGH threshold alarm
F	Frequency out of range alarm

SYMBOL	MEANING
HI1	Phase 1 current - HIGH threshold alarm
HI2	Phase 2 current - HIGH threshold alarm
HI3	Phase 3 current - HIGH threshold alarm
HIN	Neutral current - HIGH threshold alarm
HI∑	System current - HIGH threshold alarm
+kWh∑-PAR	System imported active energy - Partial c.
-kWh∑-PAR	System exported active energy - Partial c.
+kVAh∑-L-PAR	System imported ind. apparent energy - Partial c.
-kVAh∑-L-PAR	System exported ind. apparent energy - Partial c.
+kVAh∑-C-PAR	System imported cap. apparent energy - Partial c.
-kVAh∑-C-PAR	System exported cap. apparent energy - Partial c.
+kvarh∑-L-PAR	System imported ind. reactive energy - Partial c.
-kvarh∑-L-PAR	System exported ind. reactive energy - Partial c.
+kvarh∑-C-PAR	System imported cap. reactive energy - Partial c.
-kvarh∑-C-PAR	System exported cap. reactive energy - Partial c.
PhOrd	Phase order (0=123, 1=132)
IR	IR communication status (0=on, 1=off)
T	Tariff in use (0=T1, 1=T2)
ND	Not Defined

3.3 Group of measurements

When a new value is written in this object, only data corresponding to bit=1 are sent to the relevant communication addresses. E.g. 0101000000000000 this value will produce a line voltage and power factor data sending (objects 3, 4, 5, 12, 13, 14, 15, see the following legend and the chapter 5, column "Obj.").

Obj.	Communication object name	Format	DPT	Flag	Command structure
157	Group of measurements (see the following legend)	B16	NO STD	C,W,T	2 Bytes encoded: VLN|VLL|I|PF|S|P|Q|F|k(En)∑| kWhT1/2|kVAh-L-T1/2|kVAh-C-T1/2| kvarh-L-T1/2|kvarh-C-T1/2|PAR|BAL|

Table 3.3.1 – Measurements OnDemand

LEGEND FOR MEASUREMENTS:

SYMBOL	MEANING
VLN	Phase voltage (No. 0, 1, 2, 6)
VLL	Line voltage (No. 3...5)
I	Current (No. 7...11)
PF	Power factor (No. 12...15)
S	Apparent power (No. 20...23)
P	Active power (No. 16...19)
Q	Reactive power (No. 24...27)
F	Frequency (No. 28)

SYMBOL	MEANING
k(En)∑	System energy (No. 29...38)
kWhT1/2	Active energy - Tariff 1, 2 (No. 39...46, 79...86)
kVAh-L-T1/2	Apparent ind. energy - Tariff 1, 2 (No. 47...54, 87...94)
kVAh-C-T1/2	Apparent cap. energy - Tariff 1, 2 (No. 55...62, 95...102)
kvarh-L-T1/2	Reactive ind. energy - Tariff 1, 2 (No. 63...70, 103...110)
kvarh-C-T1/2	Reactive cap. energy - Tariff 1, 2 (No. 71...78, 111...118)
PAR	Partial energy counters (No. 119...128)
BAL	Balance energy counters (No. 129...133)

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4. WRITING COMMUNICATION OBJECTS

All the parameters which can be programmed can be found in this chapter.

NOTE

The number and the indication of the communication objects displayed in ETS menu can change according to the parameter settings.

FLAG LEGEND:

C → Communication R → Read W → Write T → Transmission

4.1 Energy counter management

Obj.	Communication object name	Format	DPT	Flag	Command structure
155	Set partial energy counters	U8N8	NO STD	C,W,T	Byte 2 - partial counter/s operation: $00=start $01=stop $02=reset Byte 1 - partial counter selection: $00=+kWh∑ PAR $01=-kWh∑ PAR $02=+kVAh∑-L PAR $03=-kVAh∑-L PAR $04=+kVAh∑-C PAR $05=-kVAh∑-C PAR $06=+kvarh∑-L PAR $07=-kvarh∑-L PAR $08=+kvarh∑-C PAR $09=-kvarh∑-C PAR $0A=all partial counters e.g. start +kWh∑ PAR counter $00=start $00=+kWh∑ PAR final value to be set: $0000
156	Reset energy counters (only for model with RESET function)	N8	NO STD	C,W,T	00=Total, 01=Tariff 1, 02=Tariff 2, 03=All

Table 4.1.1 – Energy counter management

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5. CYCLIC & VARIATION COMMUNICATION OBJECTS

All the communication objects set as cyclic or variation mode, can be found in this chapter.

NOTE

The number and the indication of the communication objects displayed in ETS menu can change according to the parameter settings.

FLAG LEGEND:

C → Communication **R** → Read **W** → Write **T** → Transmission

WIRING MODE LEGEND:

3.4.3 → 3 phase, 4 wires, 3 currents **3.3.3** → 3 phase, 3 wires, 3 currents **1ph** → single phase
3.3.2 → 3 phase, 3 wires, 2 currents

5.1 Realtime values

Obj.	Communication object name	Unit	Format	DPT	Flag	Wiring modes		
						3.4.3	3.3.2 3.3.3	1ph
0	Phase 1 voltage	V	F32	14.028	C,T,R	X		
1	Phase 2 voltage	V	F32	14.028	C,T,R	X		
2	Phase 3 voltage	V	F32	14.028	C,T,R	X		
3	Line 12 voltage	V	F32	14.028	C,T,R	X	X	
4	Line 23 voltage	V	F32	14.028	C,T,R	X	X	
5	Line 31 voltage	V	F32	14.028	C,T,R	X	X	
6	System voltage	V	F32	14.028	C,T,R	X	X	X
7	Phase 1 current	A	F32	14.019	C,T,R	X	X	
8	Phase 2 current	A	F32	14.019	C,T,R	X	X	
9	Phase 3 current	A	F32	14.019	C,T,R	X	X	
10	Neutral current	A	F32	14.019	C,T,R	X		
11	System current	A	F32	14.019	C,T,R	X	X	X
12	Phase 1 power factor	-	F32	14.057	C,T,R	X		
13	Phase 2 power factor	-	F32	14.057	C,T,R	X		
14	Phase 3 power factor	-	F32	14.057	C,T,R	X		
15	System power factor	-	F32	14.057	C,T,R	X	X	X
16	Phase 1 active power	W	F32	14.056	C,T,R	X		
17	Phase 2 active power	W	F32	14.056	C,T,R	X		
18	Phase 3 active power	W	F32	14.056	C,T,R	X		
19	System active power	W	F32	14.056	C,T,R	X	X	X
20	Phase 1 apparent power	VA	F32	14.056	C,T,R	X		
21	Phase 2 apparent power	VA	F32	14.056	C,T,R	X		
22	Phase 3 apparent power	VA	F32	14.056	C,T,R	X		
23	System apparent power	VA	F32	14.056	C,T,R	X	X	X
24	Phase 1 reactive power	var	F32	14.056	C,T,R	X		
25	Phase 2 reactive power	var	F32	14.056	C,T,R	X		
26	Phase 3 reactive power	var	F32	14.056	C,T,R	X		
27	System reactive power	var	F32	14.056	C,T,R	X	X	X
28	Frequency	Hz	F32	14.033	C,T,R	X	X	X

Table 5.1.1 – Realtime values

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5.2 Total energy counters

Obj.	Communication object name	Unit	Format	DPT	Flag	Wiring modes		
						3.4.3	3.3.2 3.3.3	1ph
29	System imported active energy	Wh	V64	29.010	C,T,R	X	X	X
30	System exported active energy	Wh	V64	29.010	C,T,R	X	X	X
31	System imported ind. apparent energy	VAh	V64	29.011	C,T,R	X	X	X
32	System exported ind. apparent energy	VAh	V64	29.011	C,T,R	X	X	X
33	System imported cap. apparent energy	VAh	V64	29.011	C,T,R	X	X	X
34	System exported cap. apparent energy	VAh	V64	29.011	C,T,R	X	X	X
35	System imported ind. reactive energy	varh	V64	29.012	C,T,R	X	X	X
36	System exported ind. reactive energy	varh	V64	29.012	C,T,R	X	X	X
37	System imported cap. reactive energy	varh	V64	29.012	C,T,R	X	X	X
38	System exported cap. reactive energy	varh	V64	29.012	C,T,R	X	X	X

Table 5.2.1 – Total energy counters

5.3 Tariff 1 energy counters

Obj.	Communication object name	Unit	Format	DPT	Flag	Wiring modes		
						3.4.3	3.3.2 3.3.3	1ph
39	Phase 1 imported active energy - Tariff 1	Wh	V64	29.010	C,T,R	X		
40	Phase 2 imported active energy - Tariff 1	Wh	V64	29.010	C,T,R	X		
41	Phase 3 imported active energy - Tariff 1	Wh	V64	29.010	C,T,R	X		
42	System imported active energy - Tariff 1	Wh	V64	29.010	C,T,R	X	X	X
43	Phase 1 exported active energy - Tariff 1	Wh	V64	29.010	C,T,R	X		
44	Phase 2 exported active energy - Tariff 1	Wh	V64	29.010	C,T,R	X		
45	Phase 3 exported active energy - Tariff 1	Wh	V64	29.010	C,T,R	X		
46	System exported active energy - Tariff 1	Wh	V64	29.010	C,T,R	X	X	X
47	Phase 1 imported inductive apparent energy - Tariff 1	VAh	V64	29.011	C,T,R	X		
48	Phase 2 imported inductive apparent energy - Tariff 1	VAh	V64	29.011	C,T,R	X		
49	Phase 3 imported inductive apparent energy - Tariff 1	VAh	V64	29.011	C,T,R	X		
50	System imported inductive apparent energy - Tariff 1	VAh	V64	29.011	C,T,R	X	X	X
51	Phase 1 exported inductive apparent energy - Tariff 1	VAh	V64	29.011	C,T,R	X		
52	Phase 2 exported inductive apparent energy - Tariff 1	VAh	V64	29.011	C,T,R	X		
53	Phase 3 exported inductive apparent energy - Tariff 1	VAh	V64	29.011	C,T,R	X		
54	System exported inductive apparent energy - Tariff 1	VAh	V64	29.011	C,T,R	X	X	X
55	Phase 1 imported capacitive apparent energy - Tariff 1	VAh	V64	29.011	C,T,R	X		
56	Phase 2 imported capacitive apparent energy - Tariff 1	VAh	V64	29.011	C,T,R	X		
57	Phase 3 imported capacitive apparent energy - Tariff 1	VAh	V64	29.011	C,T,R	X		
58	System imported capacitive apparent energy - Tariff 1	VAh	V64	29.011	C,T,R	X	X	X
59	Phase 1 exported capacitive apparent energy - Tariff 1	VAh	V64	29.011	C,T,R	X		
60	Phase 2 exported capacitive apparent energy - Tariff 1	VAh	V64	29.011	C,T,R	X		
61	Phase 3 exported capacitive apparent energy - Tariff 1	VAh	V64	29.011	C,T,R	X		
62	System exported capacitive apparent energy - Tariff 1	VAh	V64	29.011	C,T,R	X	X	X
63	Phase 1 imported inductive reactive energy - Tariff 1	varh	V64	29.012	C,T,R	X		
64	Phase 2 imported inductive reactive energy - Tariff 1	varh	V64	29.012	C,T,R	X		
65	Phase 3 imported inductive reactive energy - Tariff 1	varh	V64	29.012	C,T,R	X		
66	System imported inductive reactive energy - Tariff 1	varh	V64	29.012	C,T,R	X	X	X

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Obj.	Communication object name	Unit	Format	DPT	Flag	Wiring modes		
						3.4.3	3.3.2 3.3.3	1ph
67	Phase 1 exported inductive reactive energy - Tariff 1	varh	V64	29.012	C,T,R	X		
68	Phase 2 exported inductive reactive energy - Tariff 1	varh	V64	29.012	C,T,R	X		
69	Phase 3 exported inductive reactive energy - Tariff 1	varh	V64	29.012	C,T,R	X		
70	System exported inductive reactive energy - Tariff 1	varh	V64	29.012	C,T,R	X	X	X
71	Phase 1 imported capacitive reactive energy - Tariff 1	varh	V64	29.012	C,T,R	X		
72	Phase 2 imported capacitive reactive energy - Tariff 1	varh	V64	29.012	C,T,R	X		
73	Phase 3 imported capacitive reactive energy - Tariff 1	varh	V64	29.012	C,T,R	X		
74	System imported capacitive reactive energy - Tariff 1	varh	V64	29.012	C,T,R	X	X	X
75	Phase 1 exported capacitive reactive energy - Tariff 1	varh	V64	29.012	C,T,R	X		
76	Phase 2 exported capacitive reactive energy - Tariff 1	varh	V64	29.012	C,T,R	X		
77	Phase 3 exported capacitive reactive energy - Tariff 1	varh	V64	29.012	C,T,R	X		
78	System exported capacitive reactive energy - Tariff 1	varh	V64	29.012	C,T,R	X	X	X

Table 5.3.1 – Tariff 1 energy counters

5.4 Tariff 2 energy counters

Obj.	Communication object name	Unit	Format	DPT	Flag	Wiring modes		
						3.4.3	3.3.2 3.3.3	1ph
79	Phase 1 imported active energy - Tariff 2	Wh	V64	29.010	C,T,R	X		
80	Phase 2 imported active energy - Tariff 2	Wh	V64	29.010	C,T,R	X		
81	Phase 3 imported active energy - Tariff 2	Wh	V64	29.010	C,T,R	X		
82	System imported active energy - Tariff 2	Wh	V64	29.010	C,T,R	X	X	X
83	Phase 1 exported active energy - Tariff 2	Wh	V64	29.010	C,T,R	X		
84	Phase 2 exported active energy - Tariff 2	Wh	V64	29.010	C,T,R	X		
85	Phase 3 exported active energy - Tariff 2	Wh	V64	29.010	C,T,R	X		
86	System exported active energy - Tariff 2	Wh	V64	29.010	C,T,R	X	X	X
87	Phase 1 imported inductive apparent energy - Tariff 2	VAh	V64	29.011	C,T,R	X		
88	Phase 2 imported inductive apparent energy - Tariff 2	VAh	V64	29.011	C,T,R	X		
89	Phase 3 imported inductive apparent energy - Tariff 2	VAh	V64	29.011	C,T,R	X		
90	System imported inductive apparent energy - Tariff 2	VAh	V64	29.011	C,T,R	X	X	X
91	Phase 1 exported inductive apparent energy - Tariff 2	VAh	V64	29.011	C,T,R	X		
92	Phase 2 exported inductive apparent energy - Tariff 2	VAh	V64	29.011	C,T,R	X		
93	Phase 3 exported inductive apparent energy - Tariff 2	VAh	V64	29.011	C,T,R	X		
94	System exported inductive apparent energy - Tariff 2	VAh	V64	29.011	C,T,R	X	X	X
95	Phase 1 imported capacitive apparent energy - Tariff 2	VAh	V64	29.011	C,T,R	X		
96	Phase 2 imported capacitive apparent energy - Tariff 2	VAh	V64	29.011	C,T,R	X		
97	Phase 3 imported capacitive apparent energy - Tariff 2	VAh	V64	29.011	C,T,R	X		
98	System imported capacitive apparent energy - Tariff 2	VAh	V64	29.011	C,T,R	X	X	X
99	Phase 1 exported capacitive apparent energy - Tariff 2	VAh	V64	29.011	C,T,R	X		
100	Phase 2 exported capacitive apparent energy - Tariff 2	VAh	V64	29.011	C,T,R	X		
101	Phase 3 exported capacitive apparent energy - Tariff 2	VAh	V64	29.011	C,T,R	X		
102	System exported capacitive apparent energy - Tariff 2	VAh	V64	29.011	C,T,R	X	X	X
103	Phase 1 imported inductive reactive energy - Tariff 2	varh	V64	29.012	C,T,R	X		
104	Phase 2 imported inductive reactive energy - Tariff 2	varh	V64	29.012	C,T,R	X		
105	Phase 3 imported inductive reactive energy - Tariff 2	varh	V64	29.012	C,T,R	X		
106	System imported inductive reactive energy - Tariff 2	varh	V64	29.012	C,T,R	X	X	X

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Obj.	Communication object name	Unit	Format	DPT	Flag	Wiring modes		
						3.4.3	3.3.2 3.3.3	1ph
107	Phase 1 exported inductive reactive energy - Tariff 2	varh	V64	29.012	C,T,R	X		
108	Phase 2 exported inductive reactive energy - Tariff 2	varh	V64	29.012	C,T,R	X		
109	Phase 3 exported inductive reactive energy - Tariff 2	varh	V64	29.012	C,T,R	X		
110	System exported inductive reactive energy - Tariff 2	varh	V64	29.012	C,T,R	X	X	X
111	Phase 1 imported capacitive reactive energy - Tariff 2	varh	V64	29.012	C,T,R	X		
112	Phase 2 imported capacitive reactive energy - Tariff 2	varh	V64	29.012	C,T,R	X		
113	Phase 3 imported capacitive reactive energy - Tariff 2	varh	V64	29.012	C,T,R	X		
114	System imported capacitive reactive energy - Tariff 2	varh	V64	29.012	C,T,R	X	X	X
115	Phase 1 exported capacitive reactive energy - Tariff 2	varh	V64	29.012	C,T,R	X		
116	Phase 2 exported capacitive reactive energy - Tariff 2	varh	V64	29.012	C,T,R	X		
117	Phase 3 exported capacitive reactive energy - Tariff 2	varh	V64	29.012	C,T,R	X		
118	System exported capacitive reactive energy - Tariff 2	varh	V64	29.012	C,T,R	X	X	X

Table 5.4.1 – Tariff 2 energy counters

5.5 Partial energy counters

Obj.	Communication object name	Unit	Format	DPT	Flag	Wiring modes		
						3.4.3	3.3.2 3.3.3	1ph
119	System imported active energy - Partial counter	Wh	V64	29.010	C,T,R	X	X	X
120	System exported active energy - Partial counter	Wh	V64	29.010	C,T,R	X	X	X
121	System imported ind. apparent energy - Partial counter	VAh	V64	29.011	C,T,R	X	X	X
122	System exported ind. apparent energy - Partial counter	VAh	V64	29.011	C,T,R	X	X	X
123	System imported cap. apparent energy - Partial counter	VAh	V64	29.011	C,T,R	X	X	X
124	System exported cap. apparent energy - Partial counter	VAh	V64	29.011	C,T,R	X	X	X
125	System imported ind. reactive energy - Partial counter	varh	V64	29.012	C,T,R	X	X	X
126	System exported ind. reactive energy - Partial counter	varh	V64	29.012	C,T,R	X	X	X
127	System imported cap. reactive energy - Partial counter	varh	V64	29.012	C,T,R	X	X	X
128	System exported cap. reactive energy - Partial counter	varh	V64	29.012	C,T,R	X	X	X

Table 5.5.1 – Partial energy counters

5.6 Balance energy counters

Obj.	Communication object name	Unit	Format	DPT	Flag	Wiring modes		
						3.4.3	3.3.2 3.3.3	1ph
129	System active energy - Balance counter	Wh	V64	29.010	C,T,R	X	X	X
130	System inductive apparent energy - Balance counter	VAh	V64	29.011	C,T,R	X	X	X
131	System capacitive apparent energy - Balance counter	VAh	V64	29.011	C,T,R	X	X	X
132	System inductive reactive energy - Balance counter	varh	V64	29.012	C,T,R	X	X	X
133	System capacitive reactive energy - Balance counter	varh	V64	29.012	C,T,R	X	X	X

Table 5.6.1 – Balance energy counters

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