

### Control bytes for each individual phase

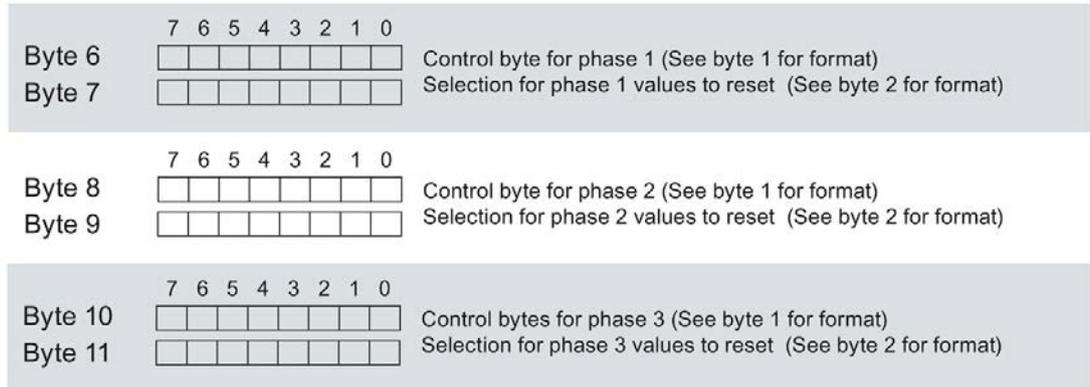


Figure C-10 Assignment of the control bytes for each individual phase (bytes 6 to 11)

## C.3 Module version "EE@Industry measured data profile" E0 / E1 / E2 / E3

### User data of the module

The four versions according to EE@Industry use between 4 and 104 bytes of input user data and 12 bytes of output user data. A run-time switchover to another Process data variant is not possible.

根据EE@Industry的四个版本,在4到104字节的输入用户数据和12字节的输出用户数据之间使用。一个运行时转换到另一个过程数据变量是不可能的。

### Structure of input user data

基于EE@Industry标准的模块版本的输入用户数据的结构是固定的,并取决于所选的测量数据概要。

The structure of the input user data for the module versions according to the EE@Industry standard is fixed and depends on the selected measurement data profile.

Table C- 7 Module version E0H input user data

Byte	Allocation	Data type	Unit	Value range	Measured value ID
0 ... 3	Current L1	REAL	1 A	0.0 ... 100000.0	7
4 ... 7	Current L2	REAL	1 A	0.0 ... 100000.0	8
8 ... 11	Current L3	REAL	1 A	0.0 ... 100000.0	9

Table C- 8 Module version E1H input user data

Byte	Allocation	Data type	Unit	Value range	Measured value ID
0 ... 3	Total active power L1L2L3	REAL	1 W	$-3.0 \times 10^9 \dots +3.0 \times 10^9$	34

Table C- 9 Module version E2H input user data

Byte	Allocation	Data type	Unit	Value range	Measured value ID
0 ... 3	Total active power L1L2L3	REAL	1 W	$-3.0 \times 10^9 \dots +3.0 \times 10^9$	34
4 ... 7	Total active energy L1L2L3 inflow	REAL	1 Wh	$0 \dots 1.8 \times 10^{38}$	210
8 ... 11	Total active energy L1L2L3 outflow	REAL	1 Wh	$0 \dots 1.8 \times 10^{38}$	211

Table C- 10 Module version E3H input user data

Byte	Allocation	Data type	Unit	Value range	Measured value ID
0 ... 3	Active power L1	REAL	1 W	$-3.0 \times 10^9 \dots +3.0 \times 10^9$	13
4 ... 7	Active power L2	REAL	1 W	$-3.0 \times 10^9 \dots +3.0 \times 10^9$	14
8 ... 11	Active power L3	REAL	1 W	$-3.0 \times 10^9 \dots +3.0 \times 10^9$	15
12 ... 15	Reactive power L1	REAL	1 var	$-3.0 \times 10^9 \dots +3.0 \times 10^9$	16
16 ... 19	Reactive power L2	REAL	1 var	$-3.0 \times 10^9 \dots +3.0 \times 10^9$	17
20 ... 23	Reactive power L3	REAL	1 var	$-3.0 \times 10^9 \dots +3.0 \times 10^9$	18
24 ... 31	Total active energy L1L2L3 inflow	LREAL	1 Wh	$0 \dots 1.8 \times 10^{308}$	210
32 ... 39	Total active energy L1L2L3 outflow	LREAL	1 Wh	$0 \dots 1.8 \times 10^{308}$	211
40 ... 47	Total reactive energy L1L2L3 inflow	LREAL	1 varh	$0 \dots 1.8 \times 10^{308}$	212
48 ... 55	Total reactive energy L1L2L3 outflow	LREAL	1 varh	$0 \dots 1.8 \times 10^{308}$	213
56 ... 59	Voltage UL1-N	REAL	1 V	$0.0 \dots 1000000.0$	1
60 ... 63	Voltage UL2-N	REAL	1 V	$0.0 \dots 1000000.0$	2
64 ... 67	Voltage UL3-N	REAL	1 V	$0.0 \dots 1000000.0$	3
68 ... 71	Voltage UL1-UL2	REAL	1 V	$0.0 \dots 1000000.0$	4
72 ... 75	Voltage UL2-UL3	REAL	1 V	$0.0 \dots 1000000.0$	5
76 ... 79	Voltage UL3-UL1	REAL	1 V	$0.0 \dots 1000000.0$	6

Byte	Allocation	Data type	Unit	Value range	Measured value ID
80 ... 83	Current L1	REAL	1 A	0.0 ... 100000.0	7
84 ... 87	Current L2	REAL	1 A	0.0 ... 100000.0	8
88 ... 91	Current L3	REAL	1 A	0.0 ... 100000.0	9
92 ... 95	Power factor L1	REAL	-	0.0 ... 1.0	19
96 ... 99	Power factor L2	REAL	-	0.0 ... 1.0	20
100 ... 103	Power factor L3	REAL	-	0.0 ... 1.0	21

### Structure of output user data

The structure of the output user data is fixed

Using the output user data you can control all or individual phase actions

- Resetting minimum values, maximum values, operating hours counter, and energy counters.
- Gate control for operating hours counter and energy counters.

Table C- 11 Structure of output user data (12 bytes) 输出用户数据结构(12字节)

Byte	Validity	Designation	Comment
0	Module	Reserved	
1	Module	Digital control outputs	Reset of values, counters, and gate control
2	Module	Digital control outputs	Selection of the energy counter to be reset
3	Module	Reserved	-
4	Module	Reserved	-
5	Module	Reserved	-
6	Phase L1	Control byte 6	Phase-specific resetting of values and counters, gate for Phase 1
7	Phase L1	Control byte 7	
8	Phase L2	Control byte 8	Phase-specific resetting of values and counters, gate for Phase 2
9	Phase L2	Control byte 9	
10	Phase L3	Control byte 10	Phase-specific resetting of values and counters, gate for Phase 3
11	Phase L3	Control byte 11	

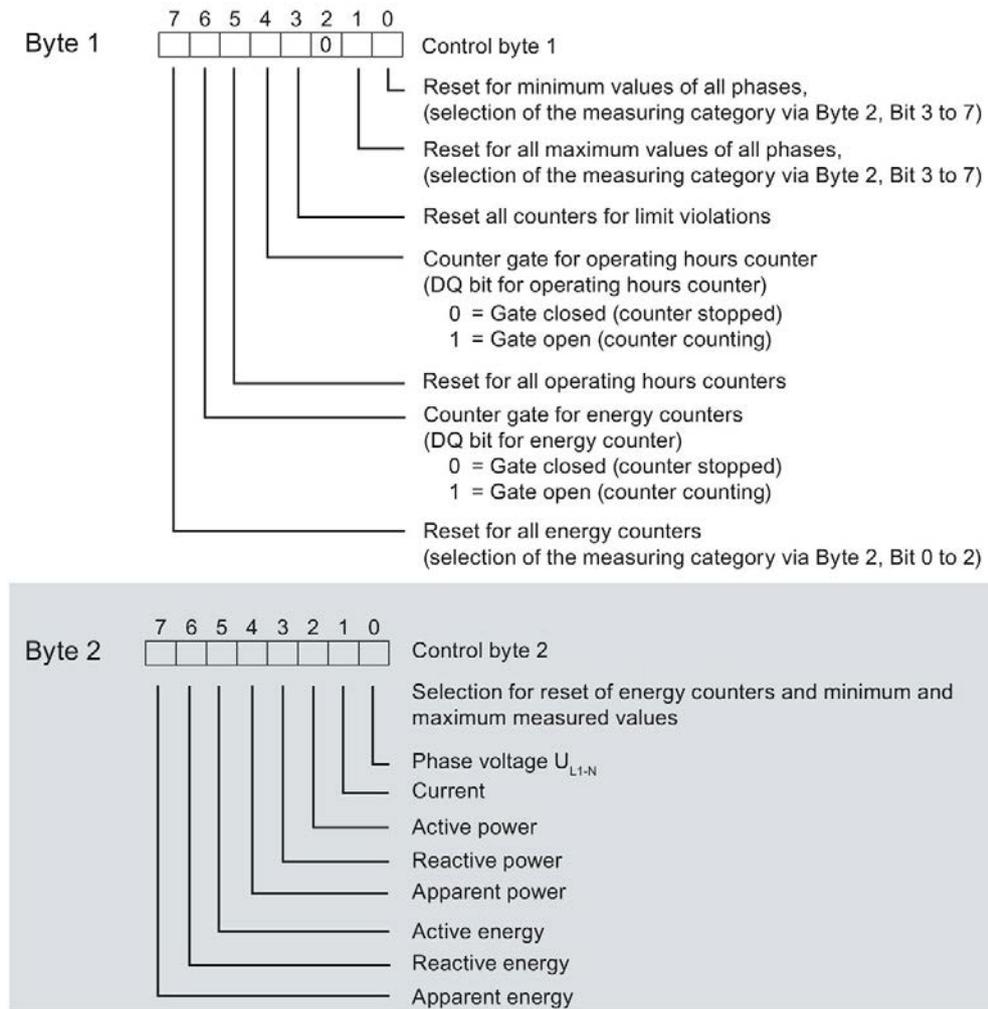


Figure C-11 Byte allocation of the 12 bytes of output data (bytes 1 to 2)

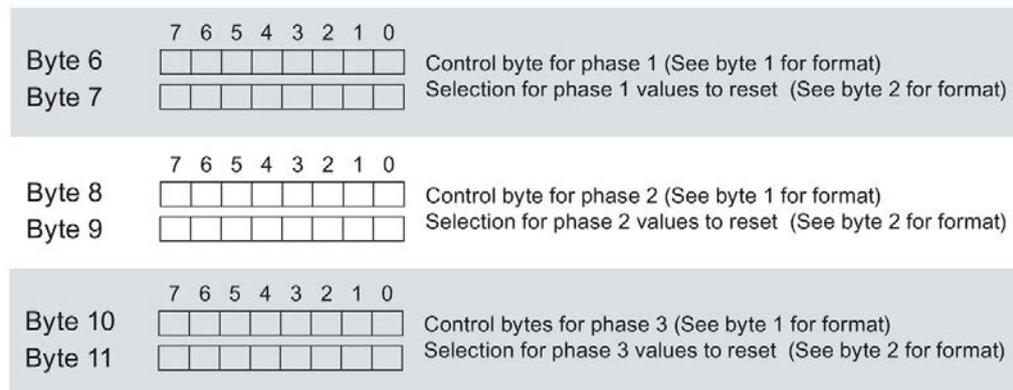


Figure C-12 Byte allocation of the 12 bytes of output data (bytes 6 to 11)

## Process data variant options

这一章可以更改测量不同的数据变量

### D.1 Overview of Process data variant options

过程数据变量选项的简述

#### Process data variant selection

数据变量选择

30 bytes/submodule is available to transfer the measured values cyclically to the input/output user data memory. You can only transmit a limited number of measured values to your program with 30 bytes of memory space. To get around this limitation, your program can change the "Process data variant" (a Siemens defined process measurement set) and begin cyclically loading the user data area with a different set of process data. The user data area is read with your program's I addresses (measurement values and status) and written with Q addresses (module control data).

#### TIA Portal SM 1238 device configuration

If you select the module version "32 bytes I/12 bytes O" or "112 bytes I/ 12 bytes O" in the device configuration, then you enable the drop-list where you can select **the initial** Process data variant. Later in RUN mode, you can change the Process data variant by writing a new ID to the Process data variant selector Q byte address.

之后再run模式，你可以通过向选择的Q区域写入一个新的ID改变进程数据变量。

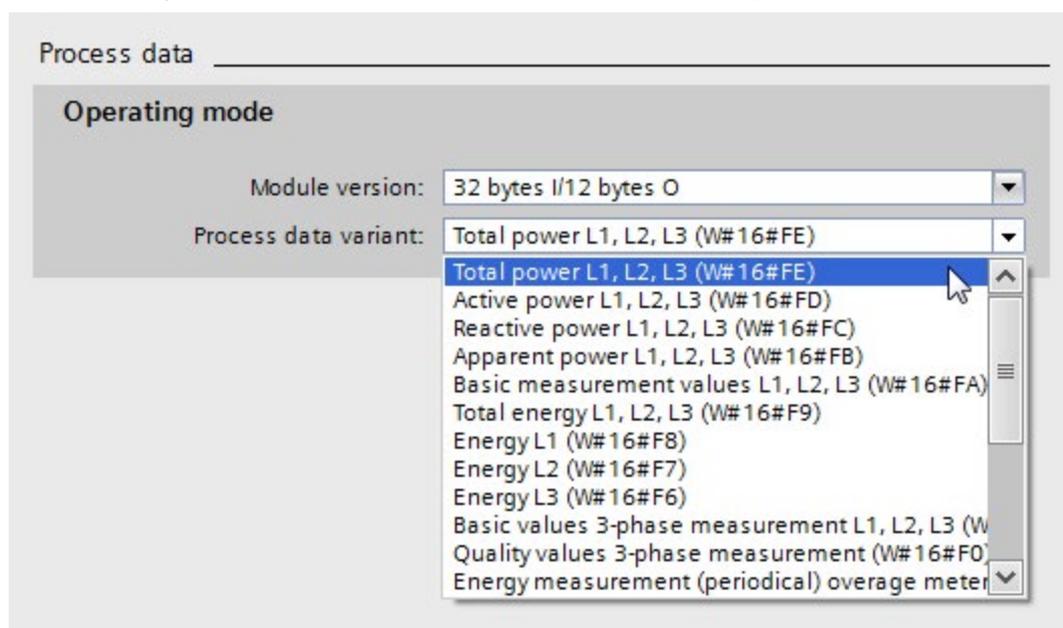


Figure D-1 TIA Portal Process data variant device configuration

## User data memory and Process data variants

Your program, while in RUN mode, can select one of 22 preconfigured Process data variants from the following table.

Process data variant name	Process data variant identifier value	User data interface required I/O bytes	
		Input I	Output Q
Total power L1, L2, L3 (Page 128)	254 or FE <sub>H</sub> (default)	32	12
Active power L1, L2, L3 (Page 129)	253 or FD <sub>H</sub>	32	12
Reactive power L1, L2, L3 (Page 130)	252 or FC <sub>H</sub>	32	12
Apparent power L1, L2, L3 (Page 131)	251 or FB <sub>H</sub>	32	12
Basic measurement values L1, L2, L3 (Page 132)	250 or FA <sub>H</sub>	32	12
Total energy L1, L2, L3 (Page 133)	249 or F9 <sub>H</sub>	32	12
Energy L1 (Page 134)	248 or F8 <sub>H</sub>	32	12
Energy L2 (Page 135)	247 or F7 <sub>H</sub>	32	12
Energy L3 (Page 136)	246 or F6 <sub>H</sub>	32	12
Basic values 3-phase measurement L1, L2, L3 (Page 137)	245 or F5 <sub>H</sub>	32	12
Quality values 3-phase measurement (Page 138)	240 or F0 <sub>H</sub>	32	12
Energy measurement (periodical) overage meter (Page 139)	239 or EF <sub>H</sub>	32	12
EE@Industry measurement data profile E3 (Page 140)	227 or E3 <sub>H</sub>	112	12
EE@Industry measurement data profile E2 (Page 141)	226 or E2 <sub>H</sub>	32	12
EE@Industry measurement data profile E1 (Page 141)	225 or E1 <sub>H</sub>	32	12
EE@Industry measurement data profile E0 (Page 142)	224 or E0 <sub>H</sub>	32	12
Basic values single phase measurement L1 (Page 142)	159 or 9F <sub>H</sub>	32	12
Basic values single phase measurement L1a (Page 143)	158 or 9E <sub>H</sub>	32	12
Basic values single phase measurement L2 (Page 144)	157 or 9D <sub>H</sub>	32	12
Basic values single phase measurement L2a (Page 145)	156 or 9C <sub>H</sub>	32	12
Basic values single phase measurement L3 (Page 146)	155 or 9B <sub>H</sub>	32	12
Basic values single phase measurement L3a (Page 147)	154 or 9A <sub>H</sub>	32	12

## D.2 Total power L1, L2, L3 (W# 16# FE)

### Total power L1, L2, L3 (ID 254 or FE<sub>H</sub>) 总功率

Table D- 1 Total power L1, L2, L3 Process data variant

Byte	Allocation	Data type	Unit	Value range	Measured value ID
0	Process data variant indicator	BYTE	-	254 (FE <sub>H</sub> )	-
1	Quality information = QQ <sub>1</sub> I <sub>3</sub> U <sub>3</sub> I <sub>2</sub> U <sub>2</sub> I <sub>1</sub> U <sub>1</sub>	BYTE	Bit string	qq xx xx xx	-
2 ... 3	Current L1	UINT	1 mA	0 ... 65535	66007
4 ... 5	Current L2	UINT	1 mA	0 ... 65535	66008
6 ... 7	Current L3	UINT	1 mA	0 ... 65535	66009
8 ... 9	Total active power L1L2L3	INT	1 W	-27648 ... 27648	66034
10 ... 11	Total reactive power L1L2L3	INT	1 var	-27648 ... 27648	66035
12 ... 13	Total apparent power L1L2L3	INT	1 VA	-27648 ... 27648	66036
14 ... 17	Total active energy L1L2L3	DINT	1 Wh	±2147483647	225
18 ... 21	Total reactive energy L1L2L3	DINT	1 varh	±2147483647	226
22	Reserved	BYTE	-	0	-
23	Total power factor L1L2L3	USINT	0.01	0 ... 100	66037
24	Scaling current L1	USINT	-	0 ... 255	-
25	Scaling current L2	USINT	-	0 ... 255	-
26	Scaling current L3	USINT	-	0 ... 255	-
27	Scaling total active power L1L2L3	USINT	-	0 ... 255	-
28	Scaling total reactive power L1L2L3	USINT	-	0 ... 255	-
29	Scaling total apparent power L1L2L3	USINT	-	0 ... 255	-
30	Scaling total active energy L1L2L3	USINT	-	0 ... 255	-
31	Scaling total reactive energy L1L2L3	USINT	-	0 ... 255	-

## D.3 Active power L1, L2, L3 (W# 16# FD)

### Active power L1, L2, L3 (ID 253 or FD<sub>H</sub>) 有功功率

Table D- 2 Active power L1, L2, L3 Process data variant

Byte	Allocation	Data type	Unit	Value range	Measured value ID
0	Process data variant indicator	BYTE	-	253 (FD <sub>H</sub> )	-
1	Quality information = QQ <sub>1</sub> I <sub>3</sub> U <sub>3</sub> I <sub>2</sub> U <sub>2</sub> I <sub>1</sub> U <sub>1</sub>	BYTE	Bit string	qq xx xx xx	-
2 ... 3	Current L1	UINT	1 mA	0 ... 65535	66007
4 ... 5	Current L2	UINT	1 mA	0 ... 65535	66008
6 ... 7	Current L3	UINT	1 mA	0 ... 65535	66009
8 ... 9	Active power L1	INT	1 W	-27648 ... 27648	66013
10 ... 11	Active power L2	INT	1 W	-27648 ... 27648	66014
12 ... 13	Active power L3	INT	1 W	-27648 ... 27648	66015
14 ... 15	Total active power L1L2L3	INT	1 W	-27648 ... 27648	66034
16 ... 19	Total active energy L1L2L3	DINT	1 Wh	±2147483647	225
20	Power factor L1	USINT	0.01	0 ... 100	66019
21	Power factor L2	USINT	0.01	0 ... 100	66020
22	Power factor L3	USINT	0.01	0 ... 100	66021
23	Total power factor L1L2L3	USINT	0.01	0 ... 100	66037
24	Scaling current L1	USINT	-	0 ... 255	-
25	Scaling current L2	USINT	-	0 ... 255	-
26	Scaling current L3	USINT	-	0 ... 255	-
27	Scaling active power L1	USINT	-	0 ... 255	-
28	Scaling active power L2	USINT	-	0 ... 255	-
29	Scaling active power L3	USINT	-	0 ... 255	-
30	Scaling active power L1L2L3	USINT	-	0 ... 255	-
31	Scaling total active energy L1L2L3	USINT	-	0 ... 255	-

## D.4 Reactive power L1, L2, L3 (W# 16# FC)

### Reactive power L1, L2, L3 (ID 252 or FC<sub>H</sub>)

Table D- 3 Reactive power L1, L2, L3 Process data variant

Byte	Allocation	Data type	Unit	Value range	Measured value ID
0	Process data variant indicator	BYTE	-	252 (FC <sub>H</sub> )	-
1	Quality information = QQ <sub>1</sub> I <sub>3</sub> U <sub>3</sub> I <sub>2</sub> U <sub>2</sub> I <sub>1</sub> U <sub>1</sub>	BYTE	Bit string	qq xx xx xx	-
2 ... 3	Current L1	UINT	1 mA	0 ... 65535	66007
4 ... 5	Current L2	UINT	1 mA	0 ... 65535	66008
6 ... 7	Current L3	UINT	1 mA	0 ... 65535	66009
8 ... 9	Reactive power L1	INT	1 var	-27648 ... 27648	66016
10 ... 11	Reactive power L2	INT	1 var	-27648 ... 27648	66017
12 ... 13	Reactive power L3	INT	1 var	-27648 ... 27648	66018
14 ... 15	Total reactive power L1L2L3	INT	1 var	-27648 ... 27648	66035
16 ... 19	Total reactive energy L1L2L3	DINT	1 varh	±2147483647	226
20	Power factor L1	USINT	0.01	0 ... 100	66019
21	Power factor L2	USINT	0.01	0 ... 100	66020
22	Power factor L3	USINT	0.01	0 ... 100	66021
23	Total power factor L1L2L3	USINT	0.01	0 ... 100	66037
24	Scaling current L1	USINT	-	0 ... 255	-
25	Scaling current L2	USINT	-	0 ... 255	-
26	Scaling current L3	USINT	-	0 ... 255	-
27	Scaling reactive power L1	USINT	-	0 ... 255	-
28	Scaling reactive power L2	USINT	-	0 ... 255	-
29	Scaling reactive power L3	USINT	-	0 ... 255	-
30	Scaling reactive power L1L2L3	USINT	-	0 ... 255	-
31	Scaling total reactive energy L1L2L3	USINT	-	0 ... 255	-

## D.5 Apparent power L1, L2, L3 (W# 16# FB)

### Apparent power L1, L2, L3 (ID 251 or FB<sub>H</sub>)

Table D-4 Apparent power L1, L2, L3 Process data variant

Byte	Allocation	Data type	Unit	Value range	Measured value ID
0	Process data variant indicator	BYTE	-	251 (FB <sub>H</sub> )	-
1	Quality information = QQ <sub>1</sub> I <sub>3</sub> U <sub>3</sub> I <sub>2</sub> U <sub>2</sub> I <sub>1</sub> U <sub>1</sub>	BYTE	Bit string	qq xx xx xx	-
2 ... 3	Current L1	UINT	1 mA	0 ... 65535	66007
4 ... 5	Current L2	UINT	1 mA	0 ... 65535	66008
6 ... 7	Current L3	UINT	1 mA	0 ... 65535	66009
8 ... 9	Apparent power L1	INT	1 VA	-27648 ... 27648	66010
10 ... 11	Apparent power L2	INT	1 VA	-27648 ... 27648	66011
12 ... 13	Apparent power L3	INT	1 VA	-27648 ... 27648	66012
14 ... 15	Total apparent power L1L2L3	INT	1 VA	-27648 ... 27648	66036
16 ... 19	Total apparent energy L1L2L3	UDINT	1 VAh	0 ... 2147483647	224
20	Power factor L1	USINT	0.01	0 ... 100	66019
21	Power factor L2	USINT	0.01	0 ... 100	66020
22	Power factor L3	USINT	0.01	0 ... 100	66021
23	Total power factor L1L2L3	USINT	0.01	0 ... 100	66037
24	Scaling current L1	USINT	-	0 ... 255	-
25	Scaling current L2	USINT	-	0 ... 255	-
26	Scaling current L3	USINT	-	0 ... 255	-
27	Scaling apparent power L1	USINT	-	0 ... 255	-
28	Scaling apparent power L2	USINT	-	0 ... 255	-
29	Scaling apparent power L3	USINT	-	0 ... 255	-
30	Scaling apparent power L1L2L3	USINT	-	0 ... 255	-
31	Scaling total apparent energy L1L2L3	USINT	-	0 ... 255	-

## D.6 Basic measurement values L1, L2, L3 (W# 16# FA)

### Basic measurement values L1, L2, L3 (ID 250 or FA<sub>H</sub>)

Table D- 5 Basic measurement values L1, L2, L3 Process data variant

Byte	Allocation	Data type	Unit	Value range	Measured value ID
0	Process data variant indicator	BYTE	-	250 (FA <sub>H</sub> )	-
1	Quality information = QQ <sub>1</sub> I <sub>3</sub> U <sub>3</sub> I <sub>2</sub> U <sub>2</sub> I <sub>1</sub> U <sub>1</sub>	BYTE	Bit string	qq xx xx xx	-
2 ... 3	Current L1	UINT	1 mA	0 ... 65535	66007
4 ... 5	Current L2	UINT	1 mA	0 ... 65535	66008
6 ... 7	Current L3	UINT	1 mA	0 ... 65535	66009
8 ... 9	Voltage UL1-N	UINT	0.01 V	0 ... 65535	66001
10 ... 11	Voltage UL2-N	UINT	0.01 V	0 ... 65535	66002
12 ... 13	Voltage UL3-N	UINT	0.01 V	0 ... 65535	66003
14 ... 15	Voltage UL1-UL2	UINT	0.01 V	0 ... 65535	66004
16 ... 17	Voltage UL2-UL3	UINT	0.01 V	0 ... 65535	66005
18 ... 19	Voltage UL3-UL1	UINT	0.01 V	0 ... 65535	66006
20	Power factor L1	USINT	0.01	0 ... 100	66019
21	Power factor L2	USINT	0.01	0 ... 100	66020
22	Power factor L3	USINT	0.01	0 ... 100	66021
23	Total power factor L1L2L3	USINT	0.01	0 ... 100	66037
24	Scaling current L1	USINT	-	0 ... 255	-
25	Scaling current L2	USINT	-	0 ... 255	-
26	Scaling current L3	USINT	-	0 ... 255	-
27	Scaling voltage UL1-N (UL1-UL2)	USINT	-	0 ... 255	-
28	Scaling voltage UL2-N (UL2-UL3)	USINT	-	0 ... 255	-
29	Scaling voltage UL3-N (UL3-UL1)	USINT	-	0 ... 255	-
30 ... 31	Frequency	UINT	0.01 Hz	4500 ... 6500	66038

## D.7 Total energy L1, L2, L3 (W# 16# F9)

### Total energy L1, L2, L3 (ID 249 or F9<sub>H</sub>)

Table D- 6 Total energy L1, L2, L3 Process data variant

Byte	Allocation	Data type	Unit	Value range	Measured value ID
0	Process data variant indicator	BYTE	-	249 (F9 <sub>H</sub> )	-
1	Quality information = QQ <sub>1</sub> I <sub>3</sub> U <sub>3</sub> I <sub>2</sub> U <sub>2</sub> I <sub>1</sub> U <sub>1</sub>	BYTE	Bit string	qq xx xx xx	-
2	Reserved	BYTE	-	-	-
3	Reserved	BYTE	-	-	-
4 ... 7	Total active energy inflow L1L2L3	UDINT	1 Wh	0 ... 2147483647	220
8 ... 11	Total active energy outflow L1L2L3	UDINT	1 Wh	0 ... 2147483647	221
11 ... 15	Total reactive energy inflow L1L2L3	UDINT	1 varh	0 ... 2147483647	222
16 ... 19	Total reactive energy outflow L1L2L3	UDINT	1 varh	0 ... 2147483647	223
20 ... 23	Total apparent energy L1L2L3	UDINT	1 VAh	0 ... 2147483647	224
24	Reserved	BYTE	-	-	-
25	Scaling active energy, inflow	USINT	-	0 ... 255	-
26	Scaling active energy, outflow	USINT	-	0 ... 255	-
27	Scaling reactive energy, inflow	USINT	-	0 ... 255	-
28	Scaling reactive energy, outflow	USINT	-	0 ... 255	-
29	Scaling apparent energy	USINT	-	0 ... 255	-
30	Reserved	BYTE	-	-	-
31	Total power factor L1L2L3	USINT	0.01	0 ... 100	66037

## D.8 Energy L1 (W# 16# F8)

### Energy L1 (ID 248 or F8<sub>H</sub>)

Table D- 7 Energy L1 Process data variant

Byte	Allocation	Data type	Unit	Value range	Measured value ID
0	Process data variant indicator	BYTE	-	248 (F8 <sub>H</sub> )	-
1	Quality information = QQ <sub>1</sub> I <sub>3</sub> U <sub>3</sub> I <sub>2</sub> U <sub>2</sub> I <sub>1</sub> U <sub>1</sub>	BYTE	Bit string	qq xx xx xx	-
2 ... 3	Current L1	UINT	1 mA	0 ... 65535	66007
4 ... 7	Active energy inflow L1	UDINT	1 Wh	0 ... 2147483647	62110
8 ... 11	Active energy outflow L1	UDINT	1 Wh	0 ... 2147483647	62111
11 ... 15	Reactive energy inflow L1	UDINT	1 varh	0 ... 2147483647	62112
16 ... 19	Reactive energy outflow L1	UDINT	1 varh	0 ... 2147483647	62113
20 ... 23	Apparent energy L1	UDINT	1 VAh	0 ... 2147483647	62114
24	Scaling current L1	USINT	-	0 ... 255	-
25	Scaling active energy inflow L1	USINT	-	0 ... 255	-
26	Scaling active energy outflow L1	USINT	-	0 ... 255	-
27	Scaling reactive energy inflow L1	USINT	-	0 ... 255	-
28	Scaling reactive energy outflow L1	USINT	-	0 ... 255	-
29	Scaling apparent energy L1	USINT	-	0 ... 255	-
30	Reserved	BYTE	-	-	-
31	Power factor L1	USINT	0.01	0 ... 100	66019

## D.9 Energy L2 (W# 16# F7)

### Energy L2 (ID 247 or F7<sub>H</sub>)

Table D- 8 Energy L2 Process data variant

Byte	Allocation	Data type	Unit	Value range	Measured value ID
0	Process data variant indicator	BYTE	-	247 (F7 <sub>H</sub> )	-
1	Quality information = QQ <sub>1</sub> I <sub>3</sub> U <sub>3</sub> I <sub>2</sub> U <sub>2</sub> I <sub>1</sub> U <sub>1</sub>	BYTE	Bit string	qq xx xx xx	-
2 ... 3	Current L2	UINT	1 mA	0 ... 65535	66008
4 ... 7	Active energy inflow L2	UDINT	1 Wh	0 ... 2147483647	62210
8 ... 11	Active energy outflow L2	UDINT	1 Wh	0 ... 2147483647	62211
11 ... 15	Reactive energy inflow L2	UDINT	1 varh	0 ... 2147483647	62212
16 ... 19	Reactive energy outflow L2	UDINT	1 varh	0 ... 2147483647	62213
20 ... 23	Apparent energy L2	UDINT	1 VAh	0 ... 2147483647	62214
24	Scaling current L2	USINT	-	0 ... 255	-
25	Scaling active energy inflow L2	USINT	-	0 ... 255	-
26	Scaling active energy outflow L2	USINT	-	0 ... 255	-
27	Scaling reactive energy inflow L2	USINT	-	0 ... 255	-
28	Scaling reactive energy outflow L2	USINT	-	0 ... 255	-
29	Scaling apparent energy L2	USINT	-	0 ... 255	-
30	Reserved	BYTE	-	-	-
31	Power factor L2	USINT	0.01	0 ... 100	66020

## D.10 Energy L3 (W# 16# F6)

### Energy L3 (ID 246 or F6<sub>H</sub>)

Table D- 9 Energy L3 Process data variant

Byte	Allocation	Data type	Unit	Value range	Measured value ID
0	Process data variant indicator	BYTE	-	246 (F6 <sub>H</sub> )	-
1	Quality information = QQ <sub>1</sub> I <sub>3</sub> U <sub>3</sub> I <sub>2</sub> U <sub>2</sub> I <sub>1</sub> U <sub>1</sub>	BYTE	Bit string	qq xx xx xx	-
2 ... 3	Current L3	UINT	1 mA	0 ... 65535	66009
4 ... 7	Active energy inflow L3	UDINT	1 Wh	0 ... 2147483647	62310
8 ... 11	Active energy L3, outflow	UDINT	1 Wh	0 ... 2147483647	62311
11 ... 15	Reactive energy inflow L3	UDINT	1 varh	0 ... 2147483647	62312
16 ... 19	Reactive energy outflow L3	UDINT	1 varh	0 ... 2147483647	62313
20 ... 23	Apparent energy L3	UDINT	1 VAh	0 ... 2147483647	62314
24	Scaling current L3	USINT	-	0 ... 255	-
25	Scaling active energy inflow L3	USINT	-	0 ... 255	-
26	Scaling active energy outflow L3	USINT	-	0 ... 255	-
27	Scaling reactive energy inflow L3	USINT	-	0 ... 255	-
28	Scaling reactive energy outflow L3	USINT	-	0 ... 255	-
29	Scaling apparent energy L3	USINT	-	0 ... 255	-
30	Reserved	BYTE	-	-	-
31	Power factor L3	USINT	0.01	0 ... 100	66021

## D.11 Basic values 3-phase measurement L1, L2, L3 (W# 16# F5)

### Basic values 3-phase measurement L1, L2, L3 (ID 245 or F5<sub>H</sub>)

Table D- 10 Basic values 3-phase measurement L1, L2, L3 Process data variant

Byte	Allocation	Data type	Unit	Value range	Measured value ID
0	Process data variant indicator	BYTE	-	245 (F5 <sub>H</sub> )	-
1	Quality information = QQ <sub>1</sub> I <sub>3</sub> U <sub>3</sub> I <sub>2</sub> U <sub>2</sub> I <sub>1</sub> U <sub>1</sub>	BYTE	Bit string	qq xx xx xx	-
2 ... 5	Total active power L1L2L3	REAL	1 W	-3.0 x 10 <sup>9</sup> ... + 3.0 x 10 <sup>9</sup>	34
6 ... 9	Total active energy outflow L1L2L3	REAL	1 Wh	0.0 ... 3.4 x 10 <sup>38</sup>	211
10 ... 13	Total active energy inflow L1L2L3	REAL	1 Wh	0.0 ... 3.4 x 10 <sup>38</sup>	210
14 ... 17	Current L1	REAL	1 A	0.0 ... 100000.0	7
18 ... 21	Current L2	REAL	1 A	0.0 ... 100000.0	8
22 ... 25	Current L3	REAL	1 A	0.0 ... 100000.0	9
26 ... 27	Voltage UL1-N	UINT	0.01 V	0 ... 65535	66001
28 ... 29	Voltage UL2-N	UINT	0.01 V	0 ... 65535	66002
30 ... 31	Voltage UL3-N	UINT	0.01 V	0 ... 65535	66003

## D.12 Quality values 3-phase measurement (W# 16# F0)

### Quality values 3-phase measurement (ID 240 or F0<sub>H</sub>)

Table D- 11 Quality values 3-phase measurement Process data variant

Byte	Allocation	Data type	Unit	Value range	Measured value ID
0	Process data variant indicator	BYTE	-	240 (F0H)	-
1	Quality information = QQ <sub>1</sub> I <sub>3</sub> U <sub>3</sub> I <sub>2</sub> U <sub>2</sub> I <sub>1</sub> U <sub>1</sub>	BYTE	Bit string	qq xx xx xx	-
2 ... 3	Reserved	WORD	-	-	-
4 ... 5	* Status of the energy counter overflows	WORD	Bit string	xxxx xxxx xxxx xxxx	65508
6 ... 7	Quality information = 00 DD QQ <sub>3</sub> QQ <sub>2</sub> QQ <sub>1</sub> I <sub>3</sub> U <sub>3</sub> I <sub>2</sub> U <sub>2</sub> I <sub>1</sub> U <sub>1</sub>	WORD	Bit string	xxxx xxxx xxxx xxxx	65503
8 ... 9	Reserved	WORD	-	-	-
10 ... 11	Reserved	WORD	-	-	-
12 ... 13	Reserved	WORD	-	-	-
14 ... 15	Reserved	WORD	-	-	-
16 ... 17	Reserved	WORD	-	-	-
18 ... 19	Reserved	WORD	-	-	-
20 ... 21	Reserved	WORD	-	-	-
22 ... 23	Reserved	WORD	-	-	-
24 ... 25	Reserved	WORD	-	-	-
26 ... 27	Reserved	WORD	-	-	-
28 ... 29	Reserved	WORD	-	-	-
30 ... 31	Reserved	WORD	-	-	-

\* Energy counter count periodically - counter overflow at:

- Bit 0 = 1: Active energy inflow L1
- Bit 1 = 1: Active energy outflow L1
- Bit 2 = 1: Reactive energy inflow L1
- Bit 3 = 1: Reactive energy outflow L1
- Bit 4 = 1: Apparent energy L1
- Bit 5 = 1: Active energy inflow L2
- Bit 6 = 1: Active energy outflow L2
- Bit 7 = 1: Reactive energy inflow L2
- Bit 8 = 1: Reactive energy outflow L2
- Bit 9 = 1: Apparent energy L2
- Bit 10 = 1: Active energy inflow L3
- Bit 11 = 1: Active energy outflow L3
- Bit 12 = 1: Reactive energy inflow L3
- Bit 13 = 1: Reactive energy outflow L3
- Bit 14 = 1: Apparent energy L3
- Bit 15: Reserved

## D.13 Energy measurement (periodical) overage meter (W# 16# EF)

### Energy measurement (periodic) overage meter (ID 239 or EF<sub>H</sub>)

Table D- 12 Energy measurement (periodic) overage meter Process data variant

Byte	Allocation	Data type	Unit	Value range	Measured value ID
0	Process data variant indicator	BYTE	-	239 (EF <sub>H</sub> )	-
1	Quality information = QQ <sub>1</sub> I <sub>3</sub> U <sub>3</sub> I <sub>2</sub> U <sub>2</sub> I <sub>1</sub> U <sub>1</sub>	BYTE	Bit string	qq xx xx xx	-
2 ... 3	Overflow counter for active energy inflow L1	UINT	-	0 ... 65535	65120
4 ... 5	Overflow counter for active energy outflow L1	UINT	-	0 ... 65535	65121
6 ... 7	Overflow counter for reactive energy inflow L1	UINT	-	0 ... 65535	65122
8 ... 9	Overflow counter for reactive energy outflow L1	UINT	-	0 ... 65535	65123
10 ... 11	Overflow counter for apparent energy L1	UINT	-	0 ... 65535	65124
12 ... 13	Overflow counter for active energy inflow L2	UINT	-	0 ... 65535	62220
14 ... 15	Overflow counter for active energy outflow L2	UINT	-	0 ... 65535	62221
16 ... 17	Overflow counter for reactive energy inflow L2	UINT	-	0 ... 65535	62222
18 ... 19	Overflow counter for reactive energy outflow L2	UINT	-	0 ... 65535	62223
20 ... 21	Overflow counter for apparent energy L2	UINT	-	0 ... 65535	62224
22 ... 23	Overflow counter for active energy inflow L3	UINT	-	0 ... 65535	62320
24 ... 25	Overflow counter for active energy outflow L3	UINT	-	0 ... 65535	62321
26 ... 27	Overflow counter for reactive energy inflow L3	UINT	-	0 ... 65535	62322
28 ... 29	Overflow counter for reactive energy outflow L3	UINT	-	0 ... 65535	62323
30 ... 31	Overflow counter for apparent energy L3	UINT	-	0 ... 65535	62324

## D.14 EE@Industry measurement data profile E3 (W# 16# E3)

### EE@Industry measurement data profile E3 (ID 227 or E3<sub>H</sub>)

Table D- 13 EE@Industry measurement data profile E3 Process data variant

Byte	Allocation	Data type	Unit	Value range	Measured value ID
0	Process data variant indicator	BYTE	-	227 (E3 <sub>H</sub> )	-
1	Quality information = QQ <sub>1</sub> I <sub>3</sub> U <sub>3</sub> I <sub>2</sub> U <sub>2</sub> I <sub>1</sub> U <sub>1</sub>	BYTE	Bit string	qq xx xx xx	-
2 ... 5	Active power L1	REAL	1 W	-3.0 x 10 <sup>9</sup> ... + 3.0 x 10 <sup>9</sup>	13
6 ... 9	Active power L2	REAL	1 W	-3.0 x 10 <sup>9</sup> ... + 3.0 x 10 <sup>9</sup>	14
10 ... 13	Active power L3	REAL	1 W	-3.0 x 10 <sup>9</sup> ... + 3.0 x 10 <sup>9</sup>	15
14 ... 17	Reactive power L1	REAL	1 var	-3.0 x 10 <sup>9</sup> ... + 3.0 x 10 <sup>9</sup>	16
18 ... 21	Reactive power L2	REAL	1 var	-3.0 x 10 <sup>9</sup> ... + 3.0 x 10 <sup>9</sup>	17
22 ... 25	Reactive power L3	REAL	1 var	-3.0 x 10 <sup>9</sup> ... + 3.0 x 10 <sup>9</sup>	18
26 ... 33	Total active energy L1L2L3 inflow	LREAL	1 Wh	0.0 ... 1.8 x 10 <sup>308</sup>	210
34 ... 41	Total active energy L1L2L3 outflow	LREAL	1 Wh	0.0 ... 1.8 x 10 <sup>308</sup>	211
42 ... 49	Total reactive energy L1L2L3 inflow	LREAL	1 varh	0.0 ... 1.8 x 10 <sup>308</sup>	212
50 ... 57	Total reactive energy L1L2L3 outflow	LREAL	1 varh	0.0 ... 1.8 x 10 <sup>308</sup>	213
58 ... 61	Voltage UL1-N	REAL	1 V	0.0 ... 1000000.0	1
62 ... 65	Voltage UL2-N	REAL	1 V	0.0 ... 1000000.0	2
66 ... 69	Voltage UL3-N	REAL	1 V	0.0 ... 1000000.0	3
70 ... 73	Voltage UL1-UL2	REAL	1 V	0.0 ... 1000000.0	4
74 ... 77	Voltage UL2-UL3	REAL	1 V	0.0 ... 1000000.0	5
78 ... 81	Voltage UL3-UL1	REAL	1 V	0.0 ... 1000000.0	6
82 ... 85	Current L1	REAL	1 A	0.0 ... 100000.0	7
86 ... 89	Current L2	REAL	1 A	0.0 ... 100000.0	8
90 ... 93	Current L3	REAL	1 A	0.0 ... 100000.0	9
94 ... 97	Power factor L1	REAL	-	0.0 ... 1.0	19
98 ... 101	Power factor L2	REAL	-	0.0 ... 1.0	20
102 ... 105	Power factor L3	REAL	-	0.0 ... 1.0	21