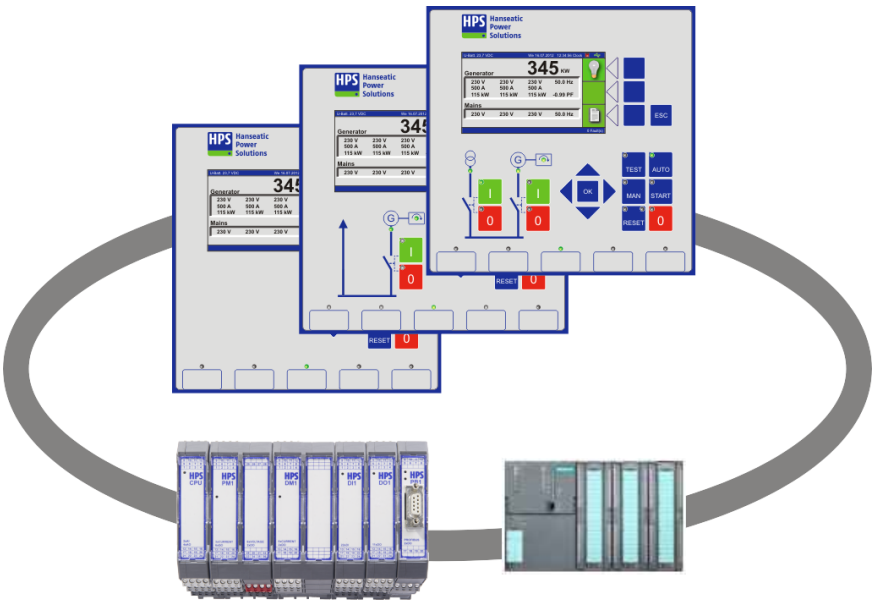
SOP 2 / KSS



LIST OF CONTENTS

1 General

The device combination SOP2 with KSS compact protection system combines the functions of the single modules into one functional unit. The SOP2 communicates with a PLC and all measured values available in the KSS will be displayed. PLC and KSS alarms are processed and visualized together via SOP2.

1.1 Functioning

1.1.1 SOP2

The SOP 2 is a microprocessor-controlled function and display LCD panel. It can be used in connection with a Simatic S7 PLC. The data are read via the communication interface of the PLC. They are then displayed as operating messages, status messages or alarm messages. The front foil-protected keyboard enables the selection of a variety of displays, which can be scrolled through.

The SOP 2 can be configured and can therefore be used for a variety of different PLC-controlled installations. A matching connection cable is required for PLC.

1.1.2 KSS

The KSS is a microprocessor-controlled protection device for the collection of all measured values of the monitored system. The system is modular in design. All components are connected via a bus connector (T bus) on the DIN rail. Measurement of the relevant values is a real r.m.s. measurement, by means of simultaneous detection. The value collection includes phase currents, phase voltages, conductor currents, active power, apparent power, reactive power, CosPhi and frequency. Depending on the selected method measuring is performed with or without star point. When measuring without a star point it is not necessary to connect a neutral wire.

Frequency measurement will only start at a measuring voltage above 45 V. Below this voltage the KSS works with a preset base frequency of 50 or 60 Hz.

The active power is calculated acc. to the formula: Therefore the active power derives from the sum of the instantaneous power over a certain period.

$$P = \int_0^t u(t) * i(t) dt$$

The apparent power is calculated from:
It derives from the sum of the rms-values of voltage and current.

$$U = \sqrt{\frac{1}{T}\int_0^T u^2 dt}; I = \sqrt{\frac{1}{T}\int_0^T i^2 dt}$$

The reactive power is calculated from: $Q = \sqrt{S^2 - P^2}$

For integration the period is defined with a frequency measurement. One period means 16 scans. Scanning and evaluation are done with a resolution of 10 bit, appropriately signed.

1.2 Commissioning

SOP 2 and KSS should be connected in accordance with the terminal assignment.

After having switched on the auxiliary voltage the SOP2 starts and establishes communication with the PLC and KSS. During initialization the module LEDs are flashing. After initialization the start screen will be shown on the SOP2, and the module LEDs will switch to steady light.

2 Device assembly

The function unit SOP2/KSS is a modular system. All KSS modules are connected via a bus connector (T-Bus) on a DIN rail. The following modules are available:

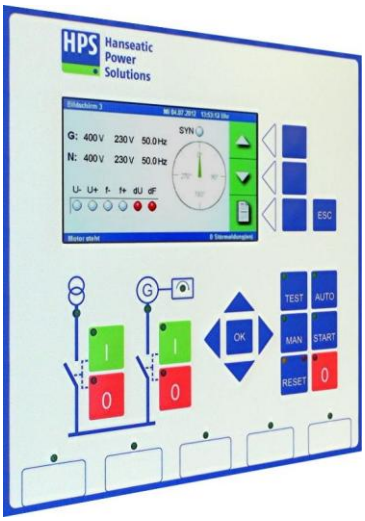
- Display and operating module SOP 2
- CPU module
- Power module PM1
- Digital input module DI1
- Digital output module DO1

The following modules are available for system extension:

- Diff. protection module DM1 (additional module)
- Profibus DP module PB1 (additional module)
- Analog input module AI1 (additional module)
- PT100(0) measurement (additional module)

The display and operating unit is designed for panel mounting with door panel. All further modules are mounted on a DIN rail in random order, connected via bus connector (T-Bus). Power is supplied by the CPU module. Display and operating unit, as well as Profibus module include a separate power supply.

2.1 Display and operating unit SOP2



The display and operating device (Panel) is used for the:

- Visualization of the measured values
- Parameterization via parameter software
- Direct device parameter input
- Manual system control

It offers:

- a memory for up to 192 error messages,
- its own galvanically isolated power supply,
- the internal data bus interface with KSS
- the external MPI data bus interface with PLC
- real-time clock with a minimum of 72 hours for data retention

2.2 CPU Module

The CPU module includes:

- the power supply of the components
- 3 digital inputs, and a pick-up input
- 2 +/- 10 V analog inputs for external predetermined nominal values
- 4 +/- 10 V analog outputs (of which 2 at a time share ground)
- an internal data bus interface (T bus)
- an external data bus interface for further components

2.3 Power Module PM1

The power module offers:

- 2 x 3-phase voltage and frequency measurements
- a 3-phase current measurement
- as well as 8 digital outputs
- and an internal data bus interface (T bus)

2.4 Digital Input Module DI1

The digital input module includes:

- 22 digital inputs
- an internal data bus interface (T bus)

2.5 Digital Output Module DO1

The digital output module offers:

- 11 potential-free digital outputs (9 x NO and 2 x CO)
- an internal data bus interface (T bus)

2.6 Diff. Protection Module DM1 (optional)

The diff. protection module contains:

- 2 x 3-phase current measurement
- as well as 2 digital outputs
- and an internal data bus interface (T bus)

2.7 Profibus DP Module PB1 (optional)

The Profibus DP module contains:

- a galvanically isolated power supply
- a Profibus DP interface (D-Sub 9)
- 2 potential-free digital outputs (NO)
- an internal data bus interface (T bus)

2.8 Profinet Module PN1 (optional)

The Profinet module contains:

- a galvanically isolated power supply
- 2 Profinet interfaces; RJ45 100Mbit/s full duplex
- 1 potential-free digital output (CO)
- an internal data bus interface (T bus)
- integrated switch functionality

2.9 Analog Input Module AI1

The analog input module offers:

- 6 galvanically isolated measurement inputs
- Input range from -10V to +10V or from -20mA to +20mA
- 2 inputs for direct potentiometer connection

2.10 PT100(0) Measurement module AT1

The analog input module offers:

- 6 PT100(0) measurement inputs
- 2 measurement inputs -10V to +10V or -20mA to +20mA

3 KSS functions

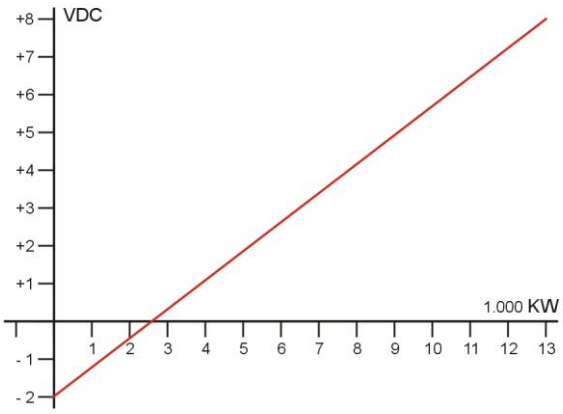
3.1 Analog inputs

The basic setup of the KSS offers two analog inputs, set by default from -10 to +10 V DC, and assigned fixed functions, for the supply of external setpoint values.

- The analog input 1 is used to capture the external setpoint specification of power in mains or generator parallel operation.
- The analog input 2 is used to capture the external setpoint specification for the power factor in mains or generator parallel operation. In case of a mains im-/export controller regulation during mains parallel operation this input is for capturing the actual mains output.

All currently applied voltage values can be scaled. For all details regarding the parameterization of analog outputs please see Item 5.8.1.

3.2 Analog outputs



The KSS has 4 analog outputs, set by default to +/- 10 V.

Different functions can be assigned to the outputs.

The voltage range of the respective analog output can be scaled.

Example: The power values collected by the KSS within a range of 0 (start value) to 13.000 kW (final value) are visualized at the analog output via a voltage range between -2,00 (start value) and +8,00 V DC (final value) (*see Fig. to the left*).

3.3 Digital In- and Outputs

Depending on the version and setup of the KSS a variable number of digital in- and outputs is available, partly with functions assigned ex works. More functions may be assigned to spare in- and outputs.

3.4 Limit values

Depending on expansion stage and variant assembly a number of minimum and maximum values are set by default from the operating and limit values for genset control. If one of the measured values turns out to be higher or lower than the respective preset limit value, an output relay – parameterized accordingly – can be energized, and the respective switching behaviour can be coded to closed or open circuit principle. As soon as the measured value returns within its preset limit, the switching step switches back to normal position with hysteresis.

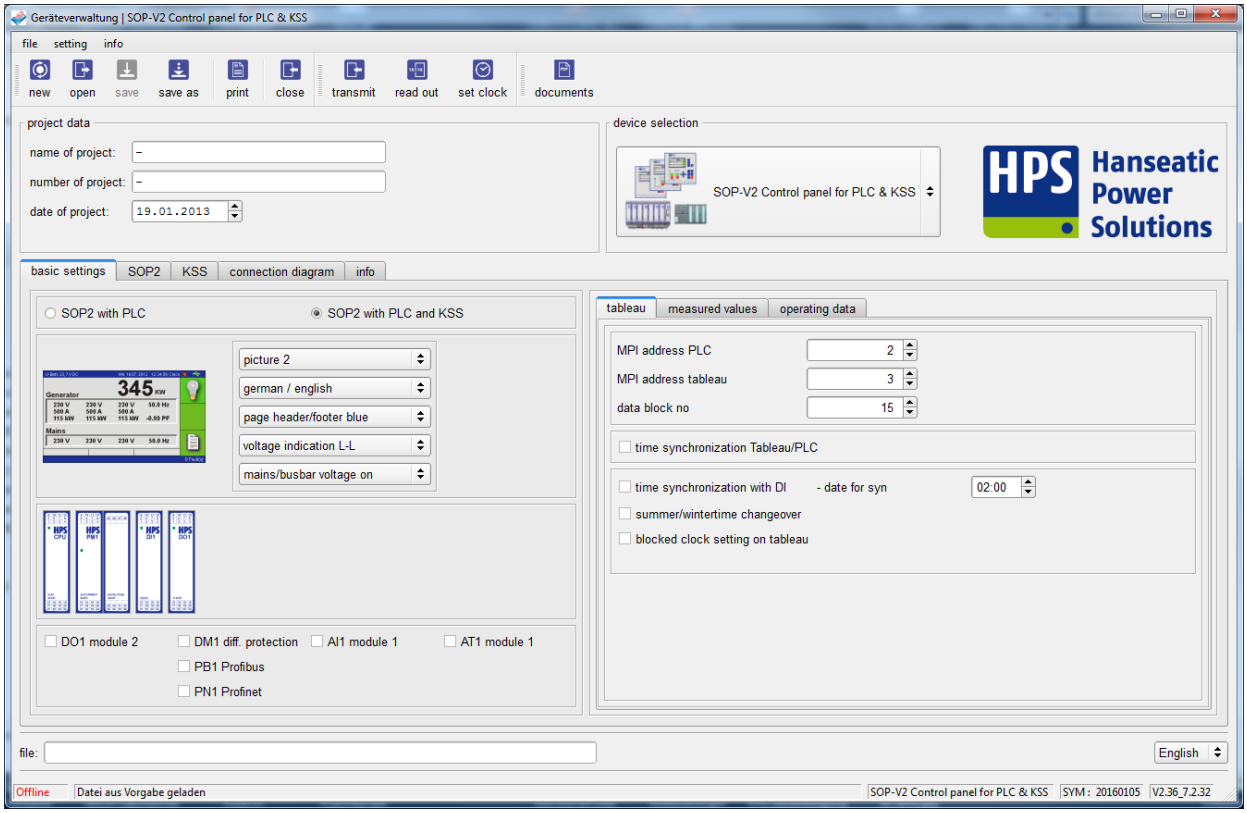
3.5 Alarms

Alarm parameterization activates the visualization of error messages in case of tripped limit values. In addition to the permanently assigned alarms there are 16 configurable alarms. The respective switching mode upon tripping can be coded acc. to the closed- or open-circuit principle.

Reset after an error message is automatically done, acc. to parameterization, via an input or the RESET key of the display and operating device SOP 2.

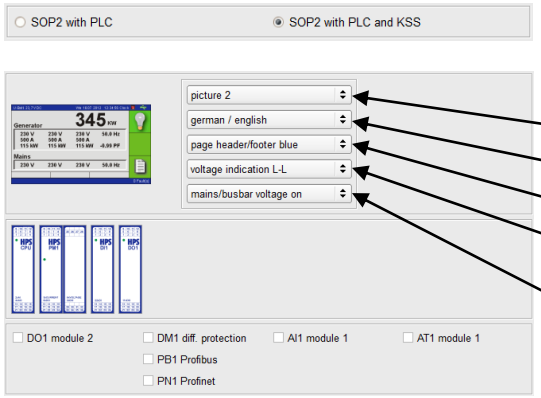
4 Settings Device Management

SOP2 and KSS parameter setting should be done with the supplied software stored on the SD card, to be found in the folder _Parametersoftware for data transfer a serial data cable (D-SUB 9pol. – 1:1) is required. Most of the parameters can also be adjusted directly at the panel (Setting→Parameter input). For an overview of all parameters please refer to Item 8.2.1. It is also possible to import software modifications via the SD card.



4.1 Basic settings

4.1.1 Hardware configuration



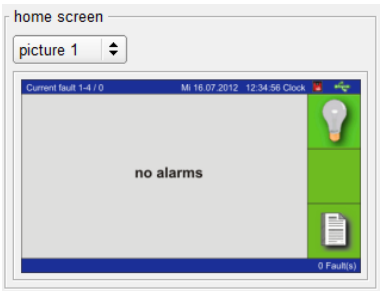
Selection of the device(s) the SOP2 will be connected to via BUS.

Display settings

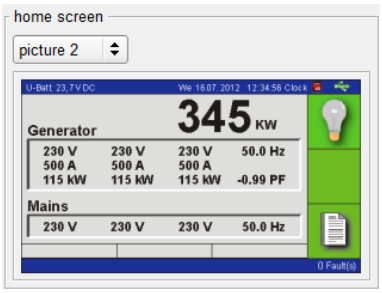
- Selection of start screen
- Selection of display language
- Color of header/footer
- Selection of voltage display for mains and generator measurement in the initial screen
- Fade out the mains / busbar voltage

Selection of modules to be installed in addition to the basic configuration

Selection of start screen. Two views are available.

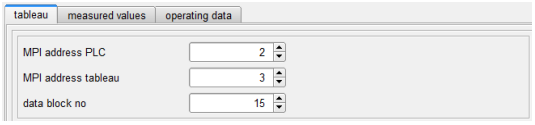


The pending error messages are displayed.

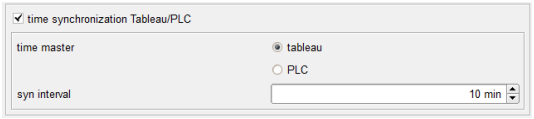


All measured values available in the KSS can be displayed with the SOP2. For further screens please got to the parameter “measured values”.

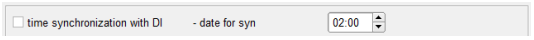
4.1.2 Tableau



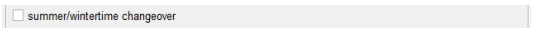
MPI
Settings for data connection via MPI with PLC



Activation of time synchronization between SOP2 and PLC. Preselection of time master, PLC or SOP2, and interval of time synchronization.



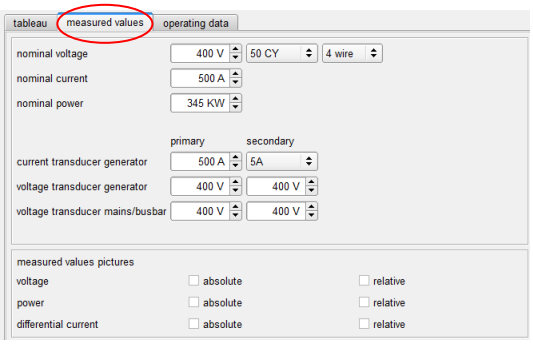
It is possible to set panel time to preset synchronization time via an appropriately configured digital input.



Automatic changeover from summer to winter time.

Furthermore clock setting can be blocked on SOP2.

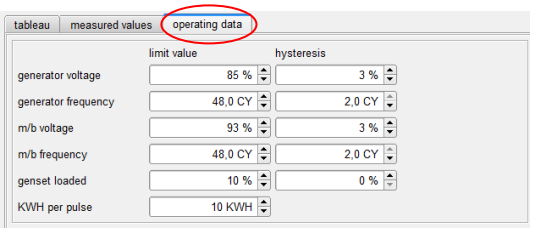
4.1.3 Measured values



Input of nominal data for voltage, current, power and transducer values. All limit values derive by percentage from the nominal data. Frequency limit values are indicated in absolute values.

„Select measured values pictures“ enables selection of additional values to be displayed via SOP2 under „Measured values“.

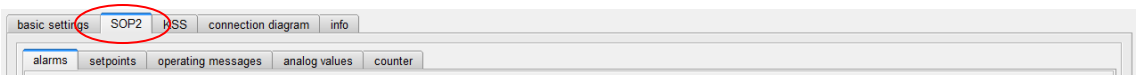
4.1.4 Operating data



When exceeding the operating values for voltage and frequency these values are declared as „Available“ and the corresponding internal operating procedures are activated.

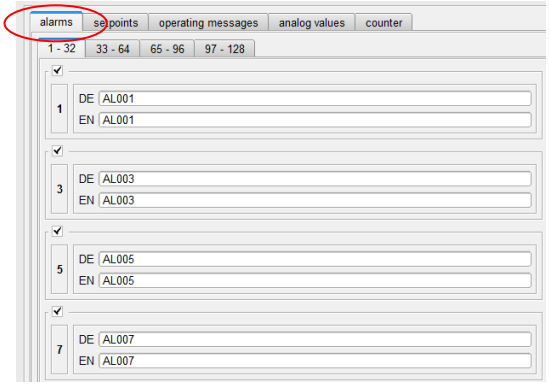
KWH value counting unit.

4.2 SOP2



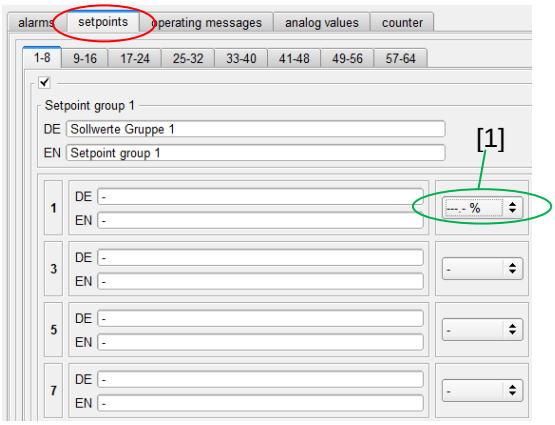
The tab „SOP2“ shows all settings and functions with PLC control.

4.2.1 Alarms



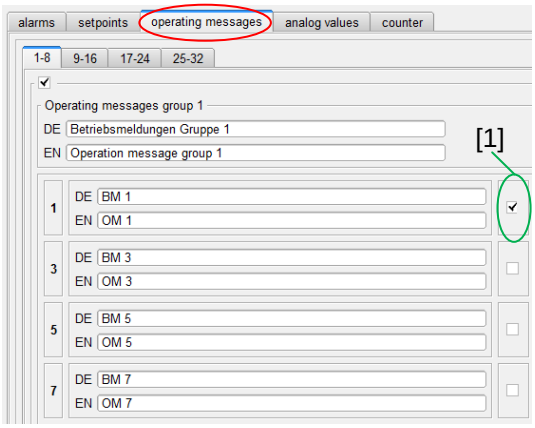
128 alarm messages are available. The alarm texts can be input in the corresponding fields. In case of an inactive alarm the field is shown grayed. The behaviour of the single alarms is set within the PLC.

4.2.2 Setpoints



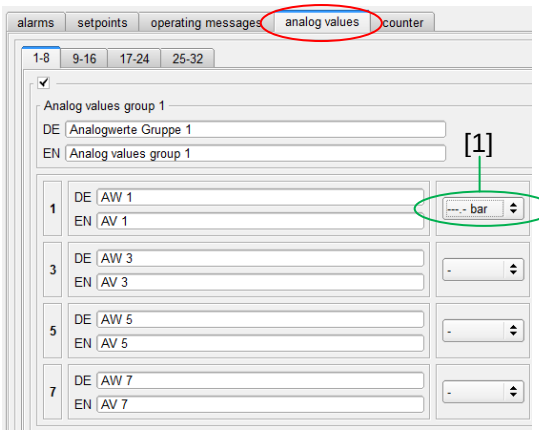
Eight groups with 64 setpoint values are available. Each group has to be enabled. Only the enabled groups will be shown in the Menu selection→Setpoints. The entire menu item will be hidden if no group is active. Group names are freely selectable. With a „-„ entered in the text fields for the name of the setpoint values this setpoint will not be shown. In a drop-down menu [1] a unit for the setpoint value can be selected. Setpoint input is done with the cursor keys of the panel.

4.2.3 Operating messages



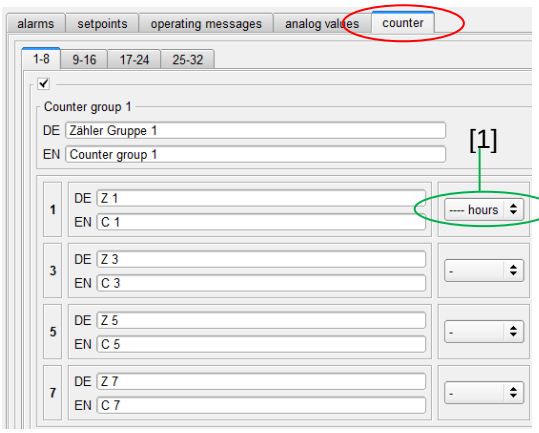
Four groups with a total of 32 operating messages are available. Each group has to be enabled. Only the enabled groups will be shown in the Menu selection→Operation messages. The entire menu item will be hidden if no group is active. Group names are freely selectable. With a „-„ entered in the text fields for the name of the operation messages this value will not be shown. Ticked operation messages [1] will be visualized via the status line at the bottom display border as soon as they are active. If there are several active messages they will be shown one after the other.

4.2.4 Analog values



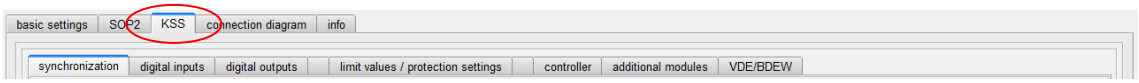
Four groups with a total of 32 analog values are available. Each group has to be enabled. Only the enabled groups will be shown in the Menu selection→Analog values. The entire menu item will be hidden if no group is active. Group names are freely selectable. With a „-„ entered in the text fields for the name of the analog values these values will not be shown. In a drop-down menu [1] a unit for the analog value can be selected.

4.2.5 Counter



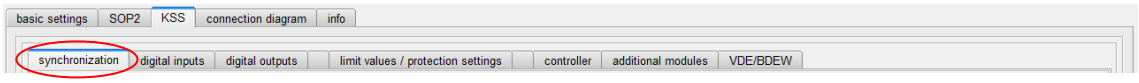
Four groups with a total of 32 counters are available. Each group has to be enabled. Only the enabled groups will be shown in the Menu selection→Counter. The entire menu item will be hidden if no group is active. Group names are freely selectable. With a „-„ entered in the text fields for the name of the counters these counters will not be shown. In a drop-down menu [1] a unit for the counter can be selected.

4.3 KSS



The tab „KSS“ shows all settings and functions under KSS control.

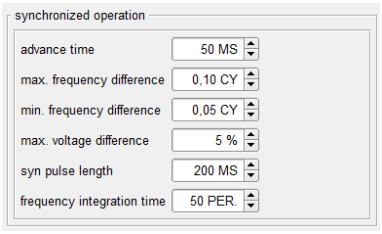
4.3.1 Synchronization



The KSS synchronizing function is used for the automatic parallel switching of three-phase current generators with each other or with another three-phase current system. Voltage and frequency will be adapted. In genset island operation mode it is possible to adjust to a preset basic frequency or voltage.

Voltage and frequency of two three-phase currents are monitored by differential amplifiers. Measurement for synchronization is done between L1 and L2. During operation all voltages and average frequencies are continuously displayed.

4.3.1.1 Synchronized operation

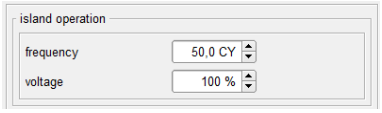


Synchronization is released via digital input 03 on the CPU module. When both three-phase current systems are within the preset limit values the SYN pulse will be output via digital output 04 on the PM1 module. Frequency and voltage adjustment can be done via analogue and digital signals. The corresponding outputs can be selected via the parameter software.

If synchronization is not done via the preset delay an error message “Synchronization delay too long” is output.

Synchronized operation	
Advance time	Serves to compensate delays caused by auxiliary switching elements. The synchronous pulse is emitted, corrected by the advance time, before the calculated synchronous moment has reached; typical delay of a breaker: 50ms.
Max. frequency difference	Max. permissible frequency deviation at which connection can take place.
Min. frequency difference	At synchronizing operation the generator is always regulated to a small frequency deviation to the mains frequency in order to keep the generator frequency in beat with the mains frequency, to make synchronizing possible at all.
Max. voltage difference	Max. permissible deviation of generator voltage against the synchronizing voltage, at which connection to the system can take place.
Syn pulse length	Time for control of the output relay.
Frequency integration time	The frequency, which is taken as the actual value for the frequency control, is averaged over several periods to steady the control circuit.

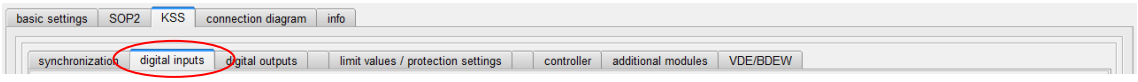
4.3.1.2 Island operation



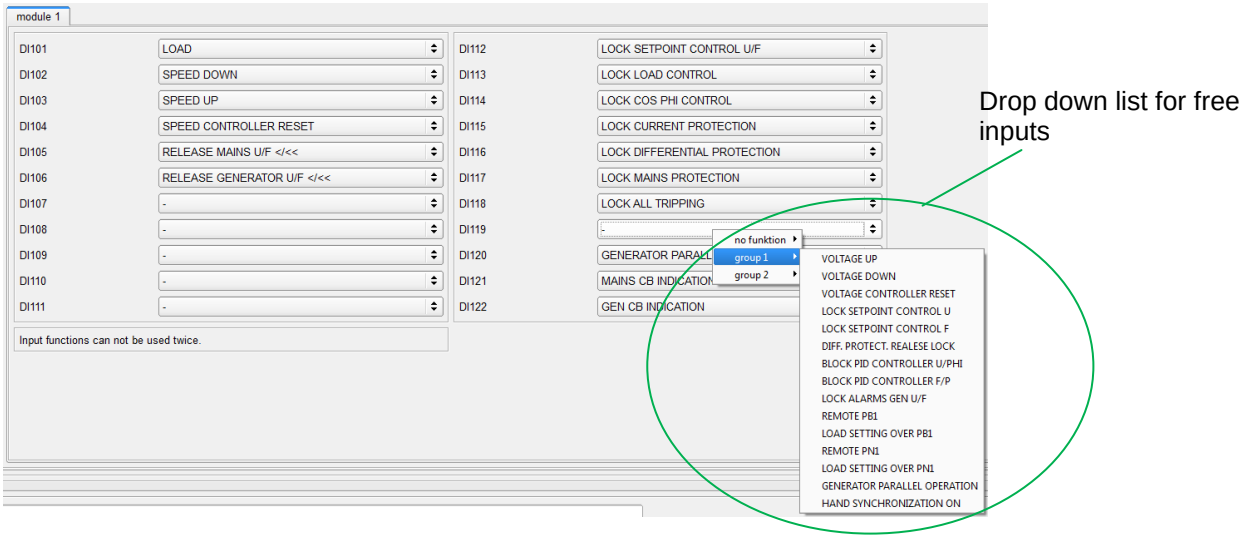
In island operation adjustment is done to the input voltage and frequency. This adjustment can be blocked via the digital input „Block setpoint control U/F“. If a setpoint value has been set to „0“ this control will be disabled.

Island operation	
Frequency	Set frequency value in island operation. If this value is set to „0“, the control will be disabled.
Voltage	Set voltage value in island operation. If this value is set to „0“, the control will be disabled.

4.3.2 Digital inputs



The digital input module offers 22 inputs. The inputs DI101 to DI106, DI112 to DI118 and DI121 to DE122 are assigned to fixed functions. All other inputs can be assigned to functions according to the drop down lists. These function lists are separated into several sub-lists.



Overview of all inputs with fixed functions.

Fixed input functions		
DE101	Load	With active load control unloading is done with the input set.
	Unload	With active load control unloading is done with the input NOT set.
DE102	Speed up	External adjustment pulses. The pulses affect the digital output (speed up) and the electr. potentiometer.
DE103	Speed down	External adjustment pulses. The pulses affect the digital output (speed down) and the electr. potentiometer.
DE104	Speed controller reset	Reset of frequency and power controller (edge-triggered). The reset affects the electr. potentiometer and the PID controller.
DE105	Release mains U/F </<<	Release of mains undervoltage/-frequency control.
DE106	Release generator U/F </<<	Release of generator undervoltage/-frequency control.
DE112	Lock setpoint control U/F	Lock island mode setpoint control.
DE113	Lock load control	Lock load control active in parallel operation.
DE114	Lock cos phi control	Lock CosPhi control active in parallel operation.
DE115	Lock current protection	Lock current protection trigger.
DE116	Lock differential protection	Lock differ. protection trigger.
DE117	Lock mains protection	Lock mains protection trigger.
DE118	Lock all tripping	Lock all tripping.
DE121	Mains CB indication	Acknowledgement for mains C.B.
	Generator parallel operation	Switchboard in generator parallel operation.
DE122	Gen CB indication	Acknowledgement for generator C.B.

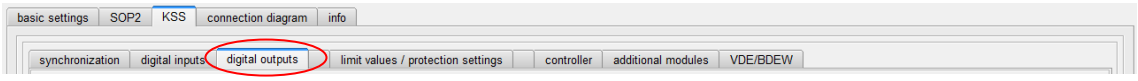
Overview of all functions assigned to free inputs.

Function number

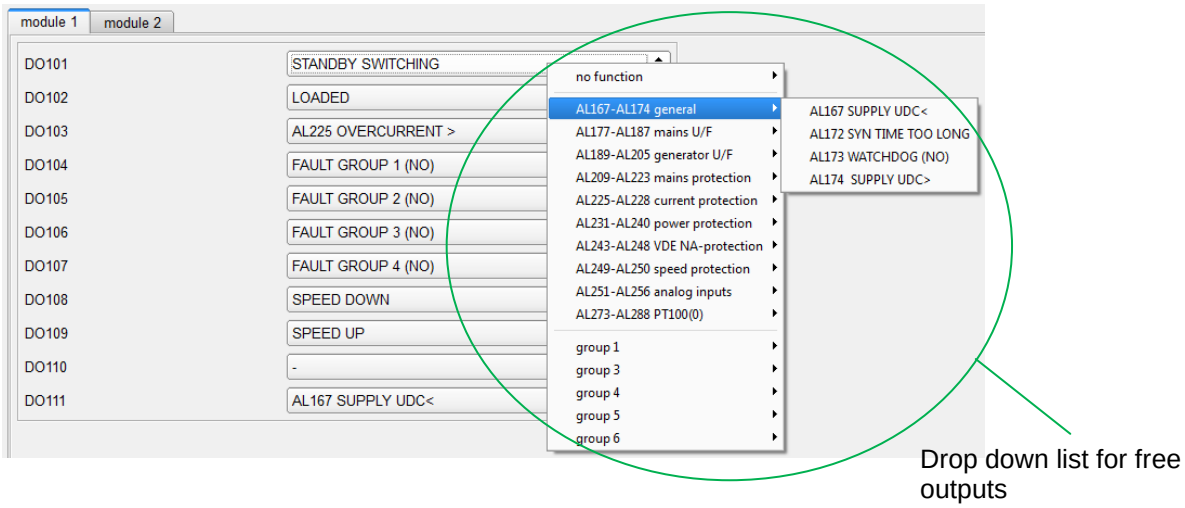
Group 1		
62	Voltage up	External adjustment pulses. The pulses affect the digital output (voltage up) and the electr. potentiometer.
63	Voltage down	External adjustment pulses. The pulses affect the digital output (voltage down) and the electr. potentiometer.
64	Voltage controller reset	Reset of voltage and CosPhi controller (edge-triggered). The reset affects the electr. potentiometer and the PID controller.
153	Lock setpoint control U	In island mode the setpoint control for voltage is locked.
154	Lock setpoint control F	In island mode the setpoint control for frequency is locked.
78	Diff. protect. release lock	Lock diff. protect. release. Blocking time starts with the rising edge at the input and ends after the time specified by parameterization. Another blocking time will only be possible after removal of the signal at the input (edge-triggered).
87	Block PID controller U/PHI	Lock PID controller for voltage and CosPhi adjustment.
88	Block PID controller F/P	Lock PID controller for frequency and power adjustment.
152	Lock alarms GEN U/F	Lock the generator alarms for voltage and frequency so that only the mains protection alarms are active in parallel operation.
57	Remote PB1	Remote control of KOP 2 via bus coupling.
116	Load setting over PB1	Only the setpoint value for the power control comes over bus coupler PB1.
149	Remote PN1	Remote control of KOP 2 via bus coupling.
150	Load setting over PN1	Only the setpoint value for the power control comes over bus coupler PN1.
60	Generator parallel operation	Switchboard in generator parallel operation.
50	Hand synchronisation on	Automatic adjustment signals for synchronisation will be disabled. Adjustment is done via the digital inputs.

Group 2		
103	VDE4105 - Ext. setpoint reduct. 1 (pulse)	Limits the power setpoint to the value specified by parameterization.
104	VDE4105 - Ext. setpoint reduct. 2 (pulse)	Limits the power setpoint to the value specified by parameterization.
105	VDE4105 - Ext. setpoint reduct. 3 (pulse)	Limits the power setpoint to the value specified by parameterization.
108	VDE4105 - Ext. setpoint reduct. reset (pulse)	Reset of setpoint limit, set via pulse inputs.
109	VDE4105 - Ext. setpoint reduct. 1 (contin.)	Limits the power setpoint to the value specified by parameterization. If several levels are set at once, the lowest value will be taken for the limitation.
110	VDE4105 - Ext. setpoint reduct. 2 (contin.)	Limits the power setpoint to the value specified by parameterization. If several levels are set at once, the lowest value will be taken for the limitation.
111	VDE4105 - Ext. setpoint reduct. 3 (contin.)	Limits the power setpoint to the value specified by parameterization. If several levels are set at once, the lowest value will be taken for the limitation.
106	VDE4105 – Cos Phi contr. / power	Activates the performance-based CosPhi control.
107	BDEW - Dynamic mains support	Activates the dynamic mains support.
114	VDE4105 - Lock standby switching mains	Locks the function „VDE4105 Standby switching mains“.

4.3.3 Digital outputs



There are two modules with a total of 22 digital outputs. All outputs can be assigned to functions according to the drop down lists. These function lists are separated into several sub-lists.



Overview of all functions assigned to free outputs.

Function number		
AL167-AL174 General		
39	AL167 Supply UDC<	If the value exceeds or falls below the previously input limit value, the released alarm can be output via a digital output.
44	AL172 Syn time too long	
45	AL173 Watchdog	
46	AL174 Supply UDC>	
AL177-AL187 Mains U/F		
49	AL177 Mains voltage <<	If the value exceeds or falls below the previously input limit value, the released alarm can be output via a digital output.
50	AL178 Mains voltage <	
51	AL179 Mains voltage >	
52	AL180 Mains voltage >>	
53	AL181 Mains frequency <<	
54	AL182 Mains frequency <	
55	AL183 Mains frequency >	
56	AL184 Mains frequency >>	
57	AL185 Mains rotating field	
58	AL186 Mains angle fault	
59	AL187 Mains voltage asymmetry	

AL189-AL205 Generator U/F		
61	AL189 BDEW U(t) time runs	If the value exceeds or falls below the previously input limit value, the released alarm can be output via a digital output.
62	AL190 BDEW U(t) fault	
65	AL193 Generator voltage <<	
66	AL194 Generator voltage <	
67	AL195 Generator voltage >	
68	AL196 Generator voltage >>	
69	AL197 Generator frequency <<	
70	AL198 Generator frequency <	
71	AL199 Generator frequency >	
72	AL200 Generator frequency >>	
73	AL201 Generator rotating field	
74	AL202 Generator angel fault	
75	AL203 Generator voltage asym.	
76	AL204 Cos Phi capacitive	
77	AL205 Cos Phi inductive	

AL209-AL223 Mains protection		
81	AL209 Mains protect. col. fault	If the value exceeds or falls below the previously input limit value, the released alarm can be output via a digital output.
82	AL210 Mains protection U<<	
83	AL211 Mains protection U<	
84	AL212 Mains protection U>	
85	AL213 Mains protection U>>	
86	AL214 Mains protection F<<	
87	AL215 Mains protection F<	
88	AL216 Mains protection F>	
89	AL217 Mains protection F>>	
90	AL218 Mains protect. vector >	
91	AL219 Mains protect. vector >>	
92	AL220 Dif. vector surge >	
93	AL221 Dif. vector surge >>	
94	AL222 Q-U protection <	
95	AL223 Q-U protection <<	

AL225-AL228 Current protection		
97	AL225 Overcurrent >	If the value exceeds or falls below the previously input limit value, the released alarm can be output via a digital output.
98	AL226 Overcurrent >>	
99	AL227 Overcur. VDE0100-718	
100	AL228 Inv. Overcur. time prot.	

AL231-AL240 Power protection		
103	AL231 VDE4105 Ext. power reduct. fault	If the value exceeds or falls below the previously input limit value, the released alarm can be output via a digital output.
104	AL232 power >	
105	AL233 power >>	
106	AL234 Reverse power >	
107	AL235 Reverse power >>	
108	AL236 Apparent power >	
109	AL237 Apparent power >>	
110	AL238 Reactive power >	
111	AL239 Reactive power >>	
112	AL240 Unbalanced load	

AL241-AL242 Differential protection		
113	AL241 Diff current >	If the value exceeds or falls below the previously input limit value, the released alarm can be output via a digital output.
114	AL242 Diff current >>	

AL243-AL248 VDE NA-protection		
115	AL243 VDE4105- Coll. fault	If the value exceeds or falls below the previously input limit value, the released alarm can be output via a digital output.
116	AL244 VDE4105 - U< (80%)	
117	AL245 VDE4105 - U>> (115%)	
118	AL246 VDE4105 - F< (47,5Hz)	
119	AL247 VDE4105 - F> (51,5Hz)	
120	AL248 VDE4105 – U> (Quality)	

AL249-AL250 Speed protection		
121	AL249 Underspeed	If the value exceeds or falls below the previously input limit value, the released alarm can be output via a digital output.
122	AL250 Overspeed	

AL251-AL256 Analog inputs		
		If the value exceeds or falls below the previously input limit value, the released alarm can be output via a digital output.
123 to 128	AL251 to AL256	AI1 Module 1 Analog input 5 to 10

AL273-AL288 PT100(0)		
		If the value exceeds or falls below the previously input limit value, the released alarm can be output via a digital output.
145 to 160	AL273 to AL288	AT1 Module1 PT1 to PT6 Analog input 23 to 24

Group 1		
132 133 136 137 138 139 140 141 142 143 144 145 146 147	Fault group 1-3 (NO) Fault group 4-6 (NO) Fault group 1 (NO) Fault group 2 (NO) Fault group 3 (NO) Fault group 4 (NO) Fault group 5 (NO) Fault group 6 (NO) Fault group 1 (NC) Fault group 2 (NC) Fault group 3 (NC) Fault group 4 (NC) Fault group 5 (NC) Fault group 6 (NC)	The digital output is set according to alarm coding. For some messages it is possible to select the output switching behaviour - NO or NC.
148	Buzzer	The output is set and reset together with the internal buzzer.
163	Signal test	The output is set via the panel test function.
164 165	Reset Acknowledge	Output for the control of external control circuits via „RESET“. The output is set as long as the key is pressed.

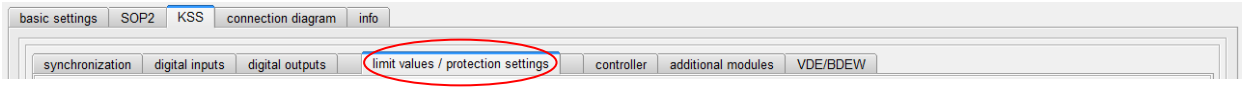
Group 3		
173	Standby switching	When exceeding the limit values for generator voltage and frequency, previously set in operating data, the output is set. If the Gen.CB is closed, only voltage will be monitored.
170	SYN release	The output is set if the SYN release is active during internal operation.
179	Deactivate C.B. interlocking	This output is used for deactivating the external key locking during synchronization. It is set with pending output „NLS or GLS Ready“ and will be switched off with key feedback.
191	Delta U OK	The output is set if the voltage is between the limits of „Max. diff. voltage“, previously adjusted for synchronization.
192	Delta F OK	The output is set if the frequency is between the limits of „Max. diff. frequency“, previously adjusted for synchronization.
166	Loaded	The output is set when the operating value „Genset loaded“ has been exceeded. When falling below this value the output will be deactivated again.
167	KWH pulse	When reaching the counter value previously input under operating data a pulse will be output. KWH counting starts again.
222	Gen C.B. indication	Output is set when feedback for Gen.CB is pending at the respective digital input.
221	Mains C.B. indication	Output is set when feedback for Mains CB is pending at the respective digital input.
206	Parallel operation	Feedbacks for Gen.CB and Mains CB are pending. Detection of parallel operation.
220	Mains voltage available	The output is set when reaching the operating value for mains voltage.

Group 4		
158	Speed down	Digital control signals for frequency and power control.
157	Speed up	Digital control signals for frequency and power control.
159	Speed controller reset	Output will be set for 1.5 secs., in compliance with one of the following requirements: Start command, Stop command or GenCB OFF.
160	Speed controller on	The output is set with speed controller ON.
162	Voltage down	Digital control signals for voltage and cos phi control.
161	Voltage up	Digital control signals for voltage and cos phi control.
216	VDE4105 – Mains standby switching (NC)	Output is set with mains within preset limit values. See Item 4.3.8.4
217	VDE4105 - Mains standby switching (NO)	Output is reset with mains within preset limit values. See Item 4.3.8.4
218	VDE4105 – Ext. setpoint reduct.select.	The output is set if setpoint reduction is selected via a digital input.
219	VDE4105 – Ext. setpoint reduct. active	The output is set if selected setpoint reduction is active.
305	VDE4105 – Ext. setpoint reduct. 1	The output is set if setpoint reduction 1 was activated by an input.
306	VDE4105 – Ext. setpoint reduct. 2	The output is set if setpoint reduction 2 was activated by an input.
307	VDE4105 – Ext. setpoint reduct. 3	The output is set if setpoint reduction 3 was activated by an input.

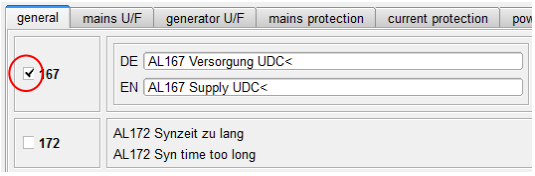
Group 5				
269	AE5<x	270	AE5>x	Each analog input of modules AI1 has two limit values. The output is set when falling below (<x) or exceeding (>x) the respective limit value.
271	AE6<x	272	AE6>x	
273	AE7<x	274	AE7>x	
275	AE8<x	276	AE8>x	
277	AE9<x	278	AE9>x	
279	AE10<x	280	AE10>x	

Group 6				
374	PT1<x	375	PT1>x	Each measurement input of modules AT1 has two limit values. The output is set when falling below (<x) or exceeding (>x) the respective limit value.
376	PT2<x	377	PT2>x	
378	PT3<x	379	PT3>x	
380	PT4<x	381	PT4>x	
382	PT5<x	383	PT5>x	
384	PT6<x	385	PT6>x	
386	AE23<x	387	AE23>x	
388	AE24<x	389	AE24>x	

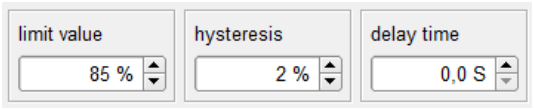
4.3.4 Limit values / Protection settings



4.3.4.1 Alarm characteristics



Any alarm to be visualized has to be released before. Alarms not yet released are greyed.

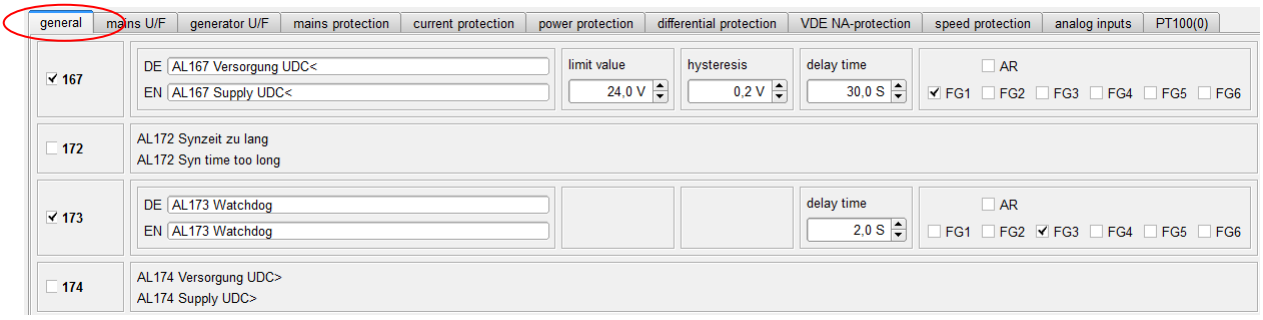


For internal alarms the alarm message is visualized acc. to the preset limit value and after expiration of the delay time.

With the coding the alarms can be customized to the corresponding applications.

INV	Inverted alarm behaviour.
AR	Autoreset – There will be an automatic reset when the alarm is not pending anymore, and the alarm reset delay has elapsed.
FG1 to FG6	Fault group 1 to 6 – The alarms can be grouped in six different groups. These groups can be adjusted to a digital output acc. to the function list.

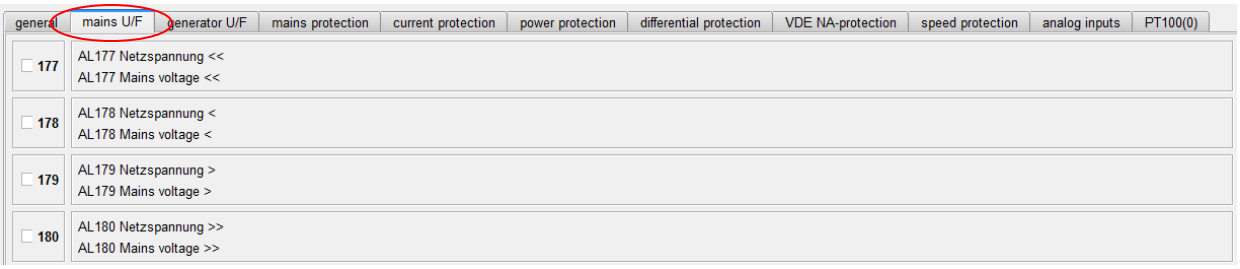
4.3.4.2 General



When exceeding or falling below the limit value the alarm is visualized acc. to the alarm behaviour (see Item 4.3.4.1) and after expiration of the delay time. All alarms can be parameterized to a digital output. It is not possible to modify the alarm message texts as the alarms are linked to internal functions.

General	
AL167 Supply UDC<	Monitoring of KSS supply voltage for undervoltage.
AL172 Syn time too long	Synchronization has to be completed with the preset time.
AL173 Watchdog	Monitoring of active BUS modules.
AL174 Supply UDC>	Monitoring of KSS supply voltage for overvoltage.

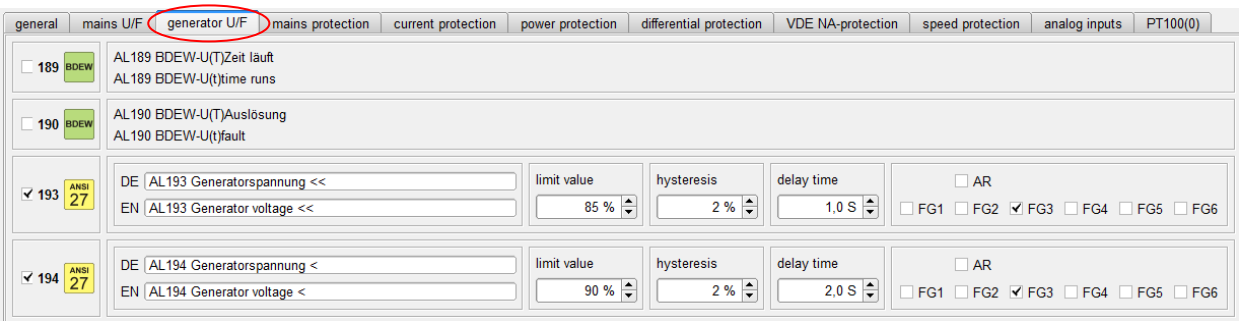
4.3.4.3 Mains U/F



When exceeding or falling below the limit value the alarm is visualized acc. to the alarm behaviour (see Item 4.3.4.1) and after expiration of the delay time. All alarms can be parameterized to a digital output. It is not possible to modify the alarm message texts as the alarms are linked to internal functions.

Mains U/F	
AL177 Mains voltage << AL178 Mains voltage < AL179 Mains voltage > AL180 Mains voltage >> AL181 Mains frequency << AL182 Mains frequency < AL183 Mains frequency > AL184 Mains frequency >>	Monitoring of mains quality. Monitoring of under-/overvoltage and under-/overfrequency of mains voltage. Monitoring only starts when mains voltage has reached its operating value. If one of the alarm values exceeds or falls below the alarm limit values the respective alarm message will be visualized after expiration of the delay time. The LED for „Mains voltage available“ is flashing and the start sequence is initiated.
AL185 Mains rotating field	Monitoring of right or left rotating field.
AL186 Mains angle fault	Maximum deviation angle for external conductors.
AL187 Mains voltage asym.	The input limit value refers to the nominal voltage. Phase current deviations may not exceed this value.

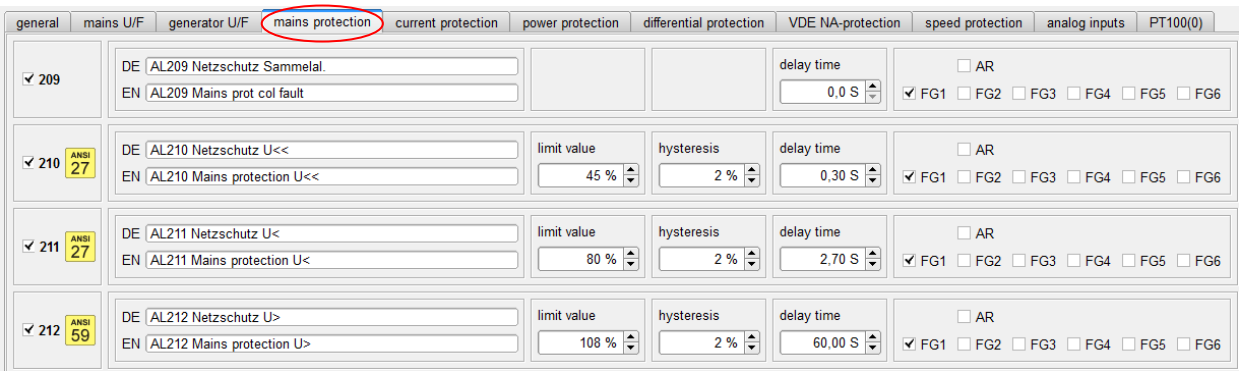
4.3.4.4 Generator U/F



When exceeding or falling below the limit value the alarm is visualized acc. to the alarm behaviour (see Item 4.3.4.1) and after expiration of the delay time. All alarms can be parameterized to a digital output. It is not possible to modify the alarm message texts as the alarms are linked to internal functions.

Generator U/F	
AL189 BDEW–U(t) time runs	Dynamic mains support. Alarm is set while time for trigger curve is running. For control if there has been a voltage drop that has not led to tripping.
AL190 BDEW–U(t) fault	Dynamic mains support. Alarm is set if voltage has not been reestablished within the preset time or disconnected from mains.
AL193 Generator voltage << AL194 Generator voltage < AL195 Generator voltage > AL196 Generator voltage >> AL197 Gen. frequency << AL198 Gen. frequency < AL199 Gen. frequency > AL200 Gen. Frequency >>	Monitoring of generator voltage and frequency.
AL201 Gen. rotating field	Monitoring of right or left rotating field.
AL202 Gen. angle fault	Maximum deviation angle for external conductors.
AL203 Gen. voltage asym.	The input limit value refers to the nominal voltage. Phase current deviations may not exceed this value.
AL204 Cos Phi capacitive	Monitoring of power factor. Capacitive limit value.
AL205 Cos Phi inductive	Monitoring of power factor. Inductive limit value.

4.3.4.5 Mains protection

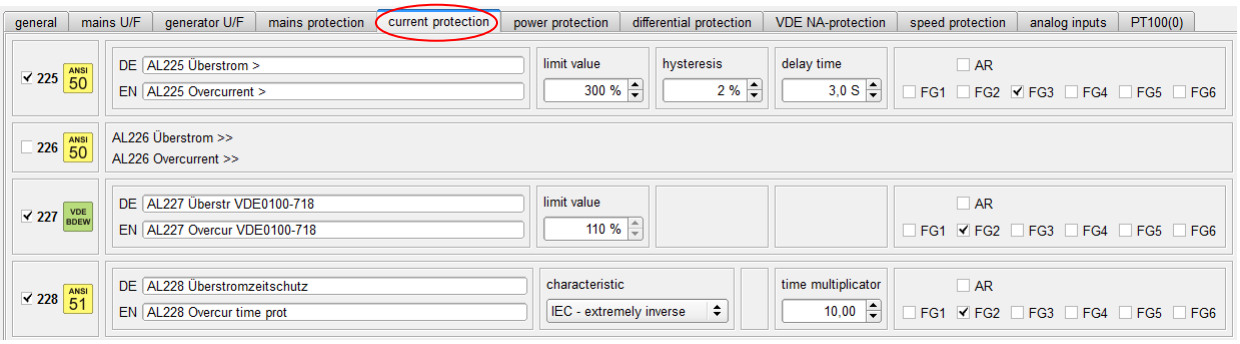


When exceeding or falling below the limit value the alarm is visualized acc. to the alarm behaviour (see Item 4.3.4.1) and after expiration of the delay time. All alarms can be parameterized to a digital output. It is not possible to modify the alarm message texts as the alarms are linked to internal functions.

The mains protection alarms are generated from the measured values on the generator voltage input.

Mains protection	
AL209 Mains protection collective fault	The mains protections collective fault is affected by all alarms activated in tab „Mains protection“. The collective fault is permanently assigned to two relays on the PM1 Module. Operation of both relays is based on the closed-circuit current principle. One relay has a normally-closed contact, the other one has a normally-open contact. Which relay is used depends on whether the mains protection has to affect the MCB or the GCB.
AL210 Mains protection U<< AL211 Mains protection U < AL212 Mains protection U > AL213 Mains protection U >> AL214 Mains protection F << AL215 Mains protection F < AL216 Mains protection F > AL217 Mains protection F >>	Monitoring of generator voltage and frequency.
AL218 Mains prot. vector > AL219 Mains prot. vector >>	Alarm is set with vector surge in one phase.
AL220 Dif. vector surge > AL221 Dif. vector surge >>	Alarm is set with a simultaneous vector surge in all three phases in the same direction.
AL222 Q-U protection < AL223 Q-U protection <<	If the voltage value falls below in all three phases and if the generating plant simultaneously **receives** inductive reactive power from the mains, the alarm is set. The limit value is set for the angle Phi is capacitive.

4.3.4.6 Current protection

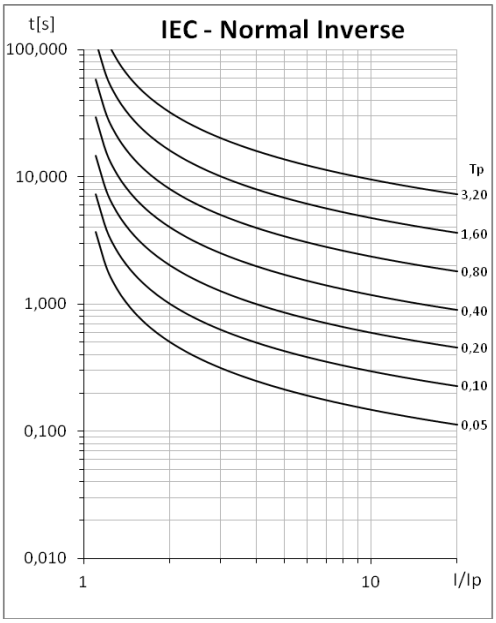


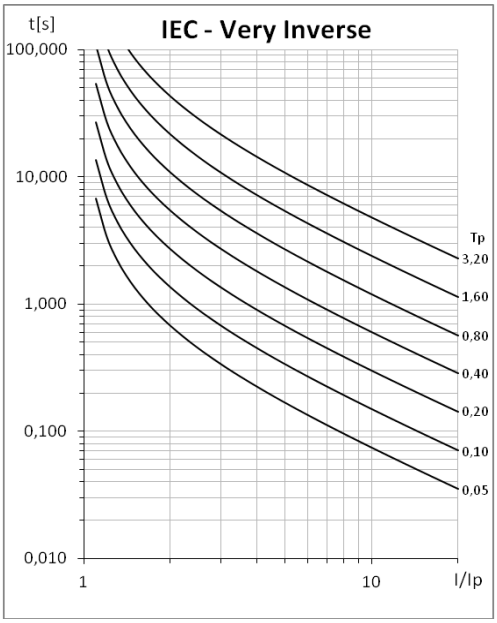
When exceeding or falling below the limit value the alarm is visualized acc. to the alarm behaviour (see Item 4.3.4.1) and after expiration of the delay time. All alarms can be parameterized to a digital output. It is not possible to modify the alarm message texts as the alarms are linked to internal functions.

The current protection function of KSS monitors the current in three-phase networks. Current metering takes place as simultaneous 3-phase sampling and is a true effective value measuring. The current measuring circuits and supply voltage are galvanically-isolated (DC) among each other and against electronic measuring equipment. An influence e.g. by earth loop is excluded. For this reason direct current metering is possible even without current transformer in a nominal current range up to 5A.

Current protection	
AL225 Overcurrent > AL226 Overcurrent >>	If the current exceeds the limit value in one phase, the alarm will be set.
AL227 Overcur. VDE100-718	The KSS complies with the requirements of the DIN VDE 0108 and DIN VDE 0100-718 (Erection of low-voltage installations - Requirements for special installations or locations - Part 718: Installations for gathering of people), according to which only for up to 60 minutes 110 % of the rated current may be delivered within a 12 hour period.
AL228 Inv. t. overcur. prot.	According to the selected ANSI or IEC curves and the adjusted time multiplier tripping is delayed depending on the overcurrent.

4.3.4.6.1 IEC Characteristics

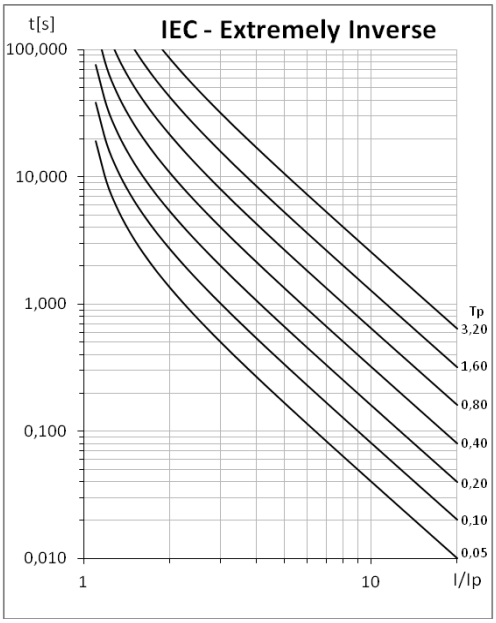


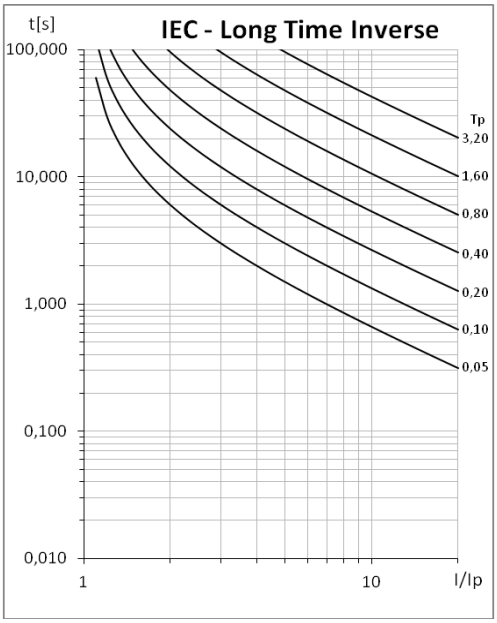


$$t = \frac{0{,}14}{\left(\frac{I}{Ip}\right)^{0{,}02} - 1} Tp$$

$$t = \frac{13{,}5}{\left(\frac{I}{Ip}\right)^{1} - 1} Tp$$

t=delay time / Tp=time multiplier / I= act. current value / Ip=nom. value



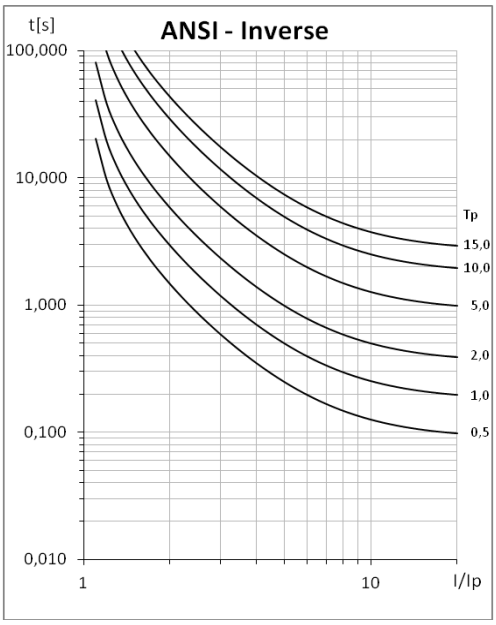


$$t = \frac{80}{\left(\frac{I}{Ip}\right)^{2} - 1} Tp$$

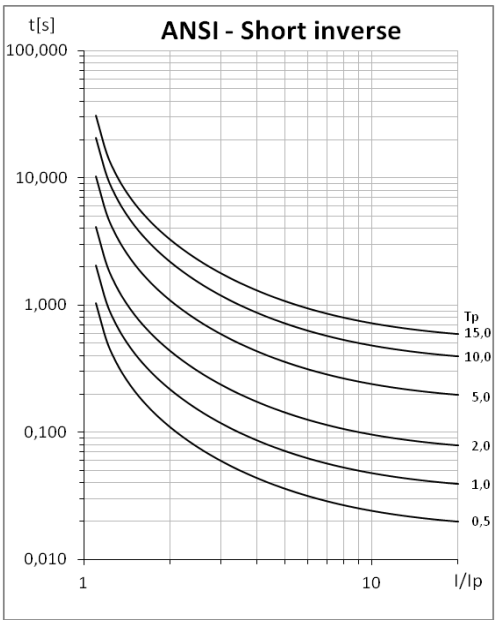
$$t = \frac{120}{\left(\frac{I}{Ip}\right)^{2} - 1} Tp$$

t=delay time / Tp=time multiplier / I= act. current value / Ip=nom. value

4.3.4.6.2 ANSI Characteristics

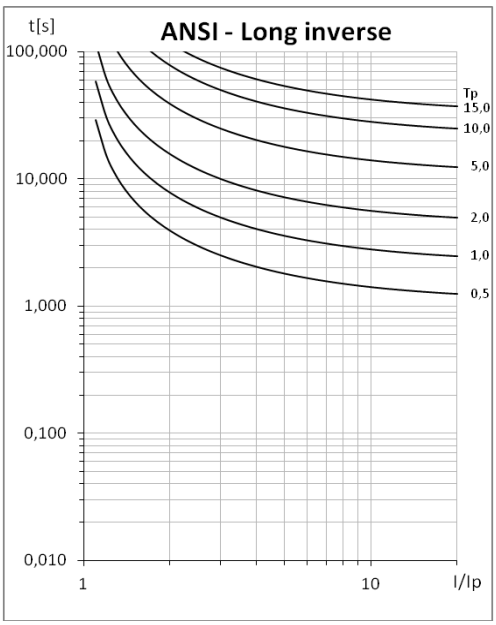


$$t = \left(\frac{8{,}9341}{\left(\frac{I}{Ip}\right)^{2{,}0938} - 1} + 0{,}17966 \right) Tp$$

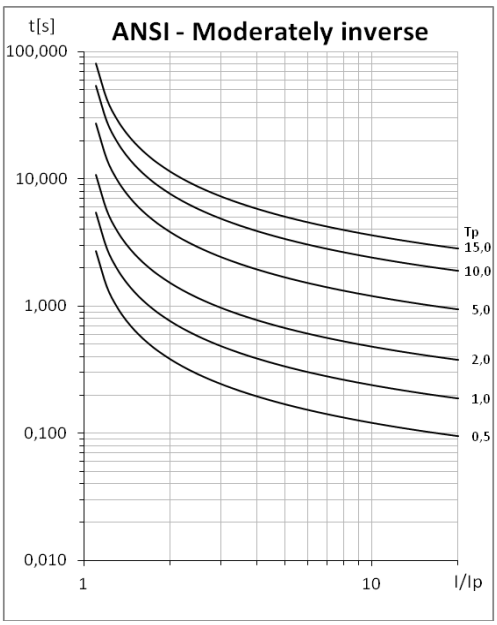


$$t = \left(\frac{0{,}2663}{\left(\frac{I}{Ip}\right)^{1{,}2969} - 1} + 0{,}03393 \right) Tp$$

t=delay time / Tp=time multiplier / I= act. current value / Ip=nom. value

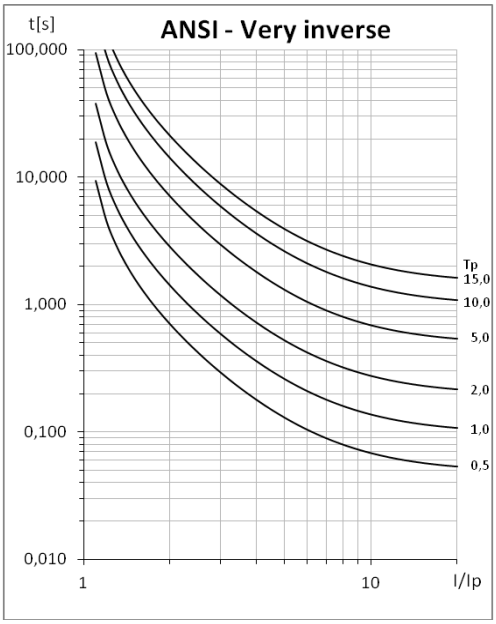


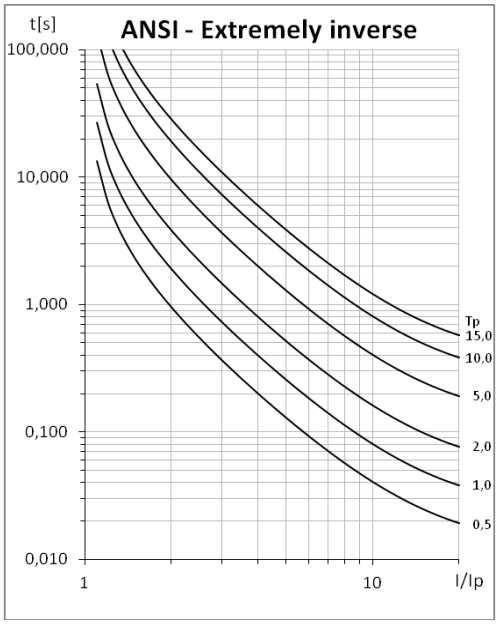
$$t = \left(\frac{5{,}6143}{\left(\frac{I}{Ip}\right)^{1} - 1} + 2{,}18592 \right) Tp$$



$$t = \left(\frac{0{,}0103}{\left(\frac{I}{Ip}\right)^{0{,}02} - 1} + 0{,}0228 \right) Tp$$

t=delay time / Tp=time multiplier / I= act. current value / Ip=nom. value

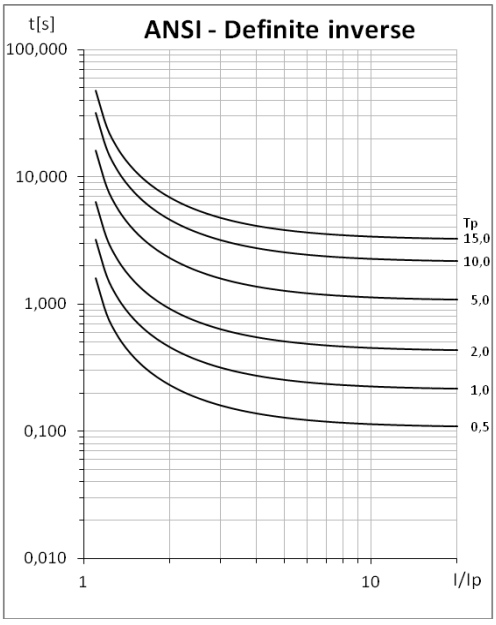




$$t = \left(\frac{3{,}922}{\left(\frac{I}{Ip}\right)^2 - 1} + 0{,}0982 \right) Tp$$

$$t = \left(\frac{5{,}64}{\left(\frac{I}{Ip}\right)^2 - 1} + 0{,}0243 \right) Tp$$

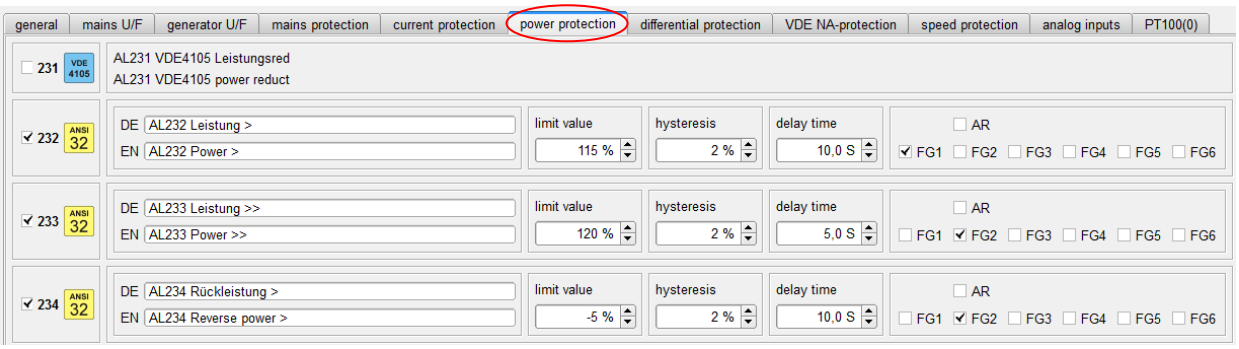
t=delay time / Tp=time multiplier / I= act. current value / Ip=nom. value



$$t = \left(\frac{0{,}4797}{\left(\frac{I}{Ip}\right)^{1{,}5625} - 1} + 0{,}21359 \right) Tp$$

t=delay time / Tp=time multiplier / I= act. current value / Ip=nom. value

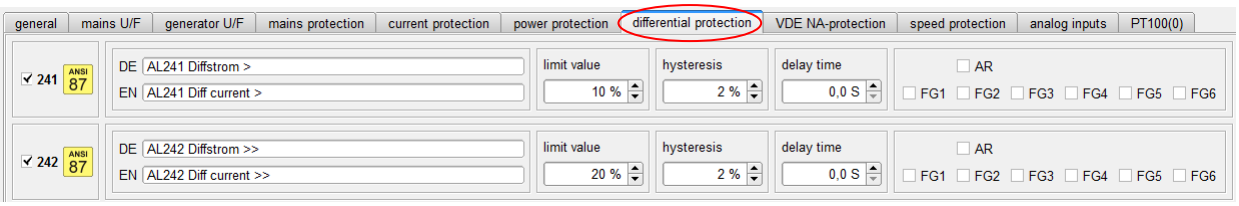
4.3.4.7 Power protection



When exceeding or falling below the limit value the alarm is visualized acc. to the alarm behaviour (see Item 4.3.4.1) and after expiration of the delay time. All alarms can be parameterized to a digital output. It is not possible to modify the alarm message texts as the alarms are linked to internal functions.

Power protection	
AL231 Power reduct.	If the setpoint value given by the external power reduction is not reached within the adjusted delay, the alarm will be set.
AL232 Power > AL233 Power >> AL234 Reverse power > AL235 Reverse power >> AL236 Apparent power > AL237 Apparent power >> AL238 Reactive power > AL239 Reactive power >>	Monitoring of power data.
AL240 Unbalanced load	The input limit value refers to the nominal power. Phase power deviations may not exceed this value.

4.3.4.8 Differential protection



When exceeding or falling below the limit value the alarm is visualized acc. to the alarm behaviour (see Item 4.3.4.1) and after expiration of the delay time. All alarms can be parameterized to a digital output. It is not possible to modify the alarm message texts as the alarms are linked to internal functions.

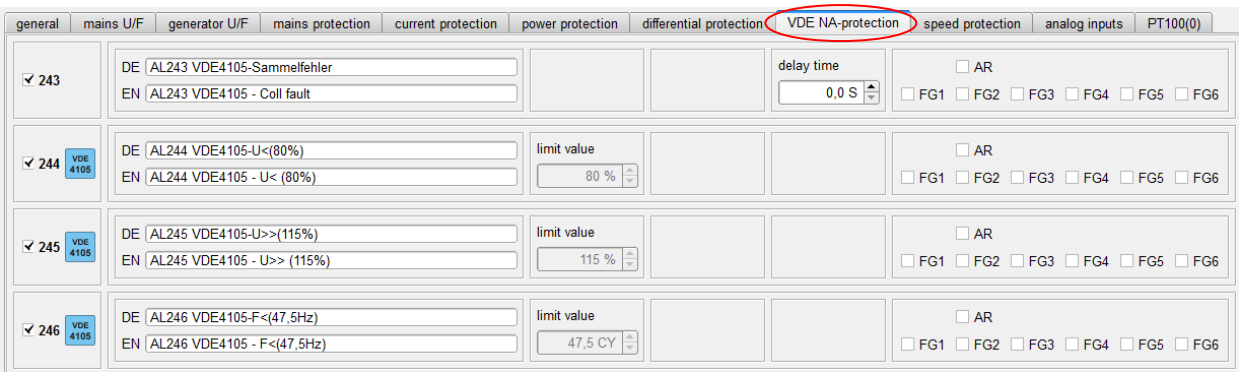
The diff.prot. alarms are visible when diff.prot. has been activated on tab „basic settings“, and the DM1 Module has to be connected to the BUS. If the module is not yet connected the alarm „Watchdog“ will appear.

The differential protection function of the KSS is to be used to protect three-phase rotary current generators or three-phase rotary current synchronous and asynchronous motors. It senses the residual currents within the protected zone, triggers when reaching the preset limit values and the corresponding error messages are displayed.

The differential protection measuring is the comparison of currents between generator star point and the outflow of generator or the supply in the switching gear. The sum of all currents must be zero.

Differential protection	
AL241 Diff current > AL242 Diff current >>	Differential currents are monitored within the protection range; tripped when preset limit values have been reached.

4.3.4.9 VDE NA-protection



When exceeding or falling below the limit value the alarm is visualized acc. to the alarm behaviour (see Item 4.3.4.1) and after expiration of the delay time. All alarms can be parameterized to a digital output. It is not possible to modify the alarm message texts as the alarms are linked to internal functions.

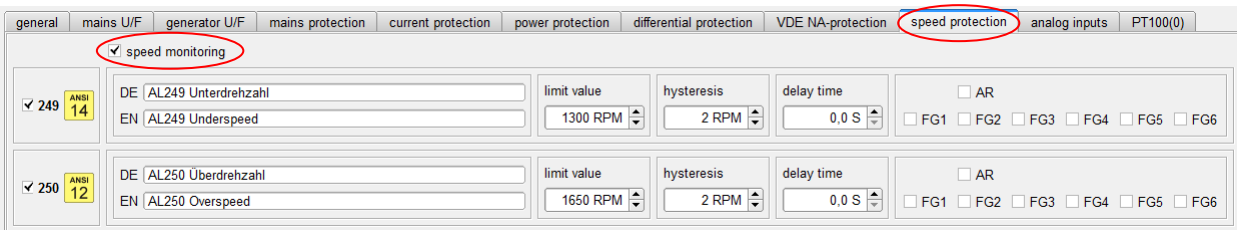
All active VDE NA-protection alarms affect the relays on the PM1, assigned to the function Mains protection. The relay operation is based on the closed-circuit current principle. One relay has a normally-closed contact, the other one has a normally-open contact. Which relay is used depends on whether the mains protection has to affect the MCB or the GCB.

In case of inadmissible voltage and frequency values NA protection, acc. to VDE4105, is for disconnecting the system from mains. NA protection is active after release of the corresponding alarms. The alarms have been set to fixed values. The only adjustable value is the 10 minutes‘ average value protection, against exceeding the upper voltage limit. This value can be adjusted between 110% and 115%, and is generated Alarm 120.

The VDE-NA protection alarms are generated from the measured values on the generator voltage input.

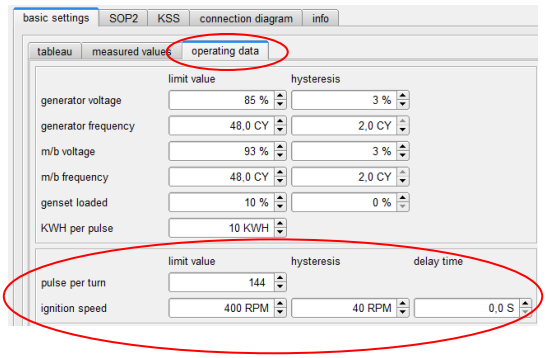
VDE NA-protection	
AL243 VDE4105 – Coll. fault	The coll. fault is affected by all alarms activated in tab „VDE NA-protection“.
AL244 VDE4105 - U< (80%) AL245 VDE4105 - U>> (115%) AL246 VDE4105 - F< (47,5Hz) AL247 VDE4105 - F> (51,5Hz)	Monitoring of voltage and frequency. It is not possible to modify the limit values.
AL248 VDE4105 - U> (Quality)	Monitoring of the 10-mins-average-voltage-value.

4.3.4.10 Speed protection



When the speed monitoring is activated the available alarms can be released.

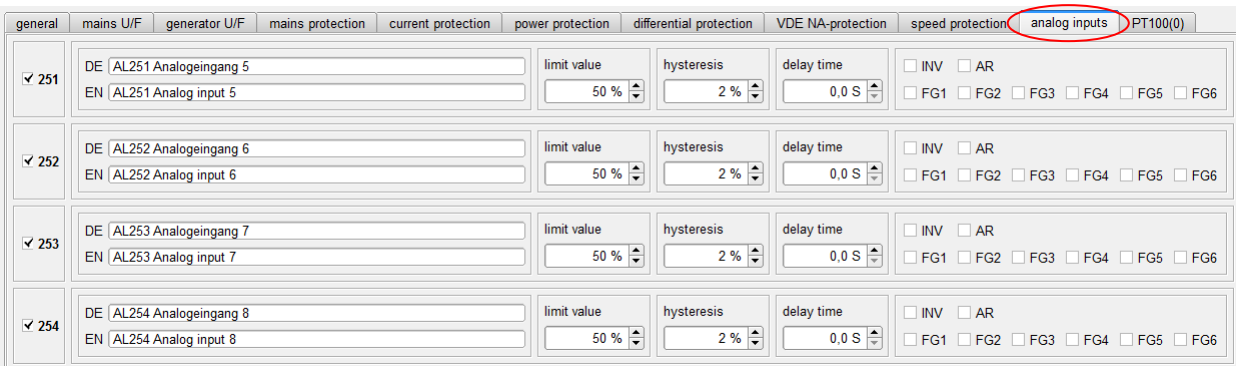
When exceeding or falling below the limit value the alarm is visualized acc. to the alarm behaviour (see Item 4.3.4.1) and after expiration of the delay time. All alarms can be parameterized to a digital output. It is not possible to modify the alarm message texts as the alarms are linked to internal functions.



If the speed protection is enabled a Pick-Up has to be connected for speed measurement. In order to display the correct speed and to monitor the speed, the pulses per turn and the ignition speed have to be input under tab Basic settings→Operating data. Furthermore two alarms can be activated for speed monitoring for under- or overspeed.

Speed protection	
AL249 Underspeed AL250 Overspeed	Monitoring of motor speed.

4.3.4.11 Analog inputs

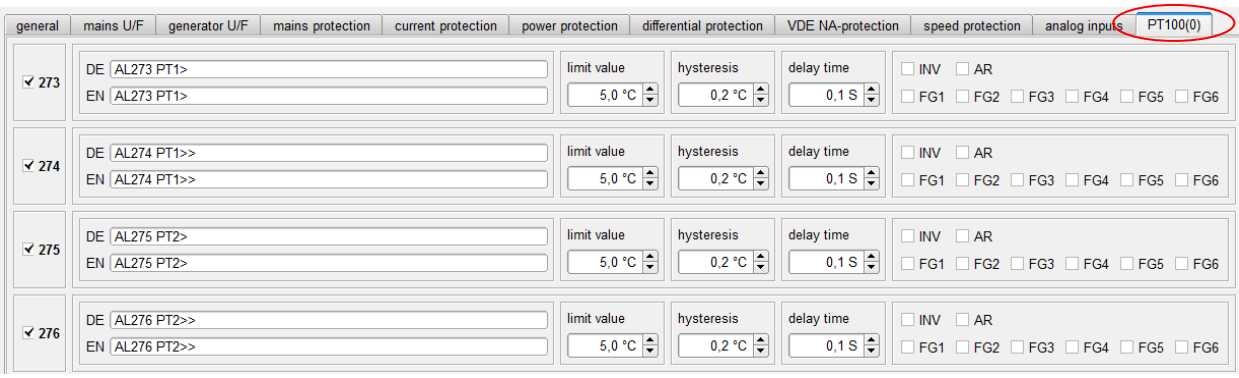


When exceeding or falling below the limit value the alarm is visualized acc. to the alarm behaviour (see Item 4.3.4.1) and after expiration of the delay time. All alarms can be parameterized to a digital output. It is not possible to modify the alarm message texts as the alarms are linked to internal functions.

The alarms will only be displayed with the corresponding modules enabled under tab “basic settings”.

Analog inputs	
AL251 Analog input 5 to AL254 Analog input 10	Module 1 – Each analog input on the additional modules is assigned to an alarm. The alarm is set if the value exceeds or falls below the limit value. It is possible to edit the alarm text.

4.3.4.12 PT100(0)

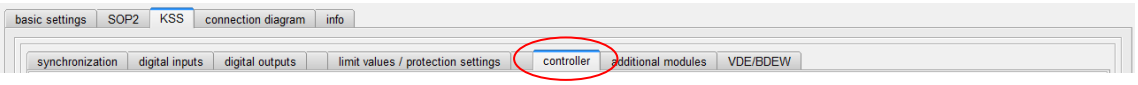


When exceeding or falling below the limit value the alarm is visualized acc. to the alarm behaviour (see Item 4.3.4.1) and after expiration of the delay time. All alarms can be parameterized to a digital output. It is not possible to modify the alarm message texts as the alarms are linked to internal functions.

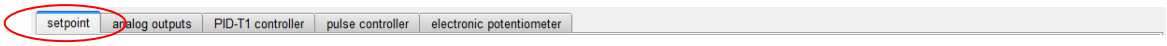
The alarms will only be displayed with the AT1 modules enabled under tab “basic settings”.

PT100(0)	
AL145 to AL156 PT1 to PT6 AL156 to AL160 AE23 to AE24	Module 1 – Each measurement input on the additional modules is assigned to two alarms. The alarm is set if the value exceeds or falls below the limit value. It is possible to edit the alarm text.

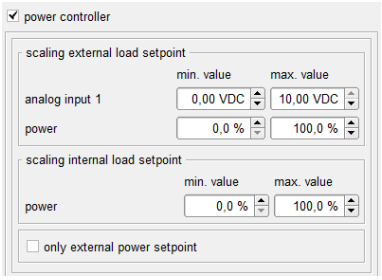
4.3.4.13 Controller



4.3.4.14 Setpoint



4.3.4.14.1 Power controller



Scaling of the load setpoint, given from analog input 1.

Furthermore the panel load setpoint input range can be defined.

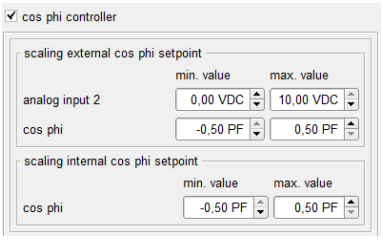
If „Only external power setpoint“ has been selected, it is not possible anymore to modify the setpoint at the panel. Setpoint adjustment has always to be done via analog input.

Power control is active in mains or generator parallel operation mode of the KSS, for genset regulation to a preset power export value. The KSS will compare the actual power with the expected power. The output value is specified directly at the SOP 2 by external control via a 0 ... 10 VDC input. The preset values are also kept if the 24V voltage supply fails.

In mains parallel operation mode power control is permanently active. In generator parallel operation mode will be selected via the configurable digital input 'first clothing/pilot', if power control or the 50 Hz control (Pilot) are active after having switched the Gen. CB on.

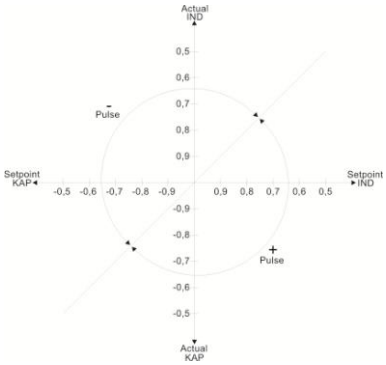
In generator switchgear the Gen. CB needs the initial connection release for connection onto a dead bus bar. If the input continues to remain set the 50Hz control affects the unit. If the input is deactivated again after connection, the power control affects the unit. In generator switchgear the Gen. CB needs the initial connection release for connection onto a dead bus bar. If the input continues to remain set the 50Hz control affects the unit. If the input is deactivated again after connection, the power control affects the unit.

4.3.4.14.2 Cos Phi controller



Scaling of cos phi setpoint, given via analog input 2.

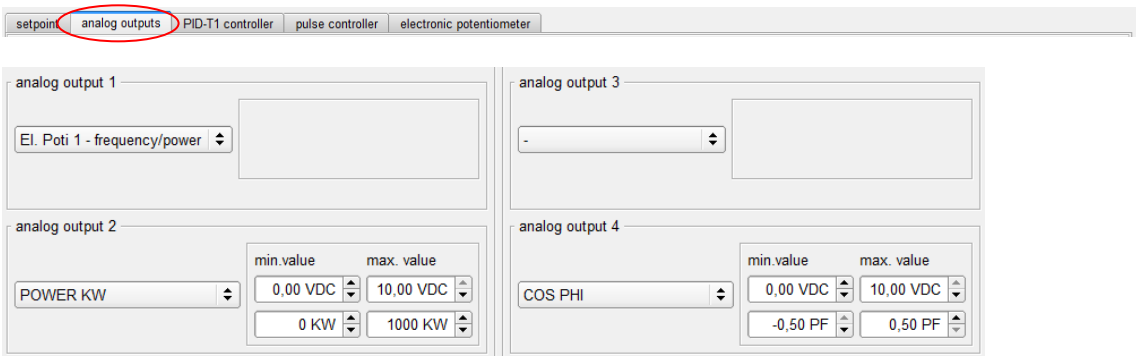
Furthermore the panel scaling range for the cos phi setpoint can be limited.



In order to avoid transmission losses a power factor as high as possible is the aim. With its Cos Phi controller the compact automatic KSS meets the corresponding demands for power-factor-related system control.

The Cos Phi controller is only active in parallel operation mode. In island operation mode the voltage is adjusted. In order to deactivate the controller in parallel operation mode, a digital input, assigned with the function Lock Cos Phi controller', has to be accessed.

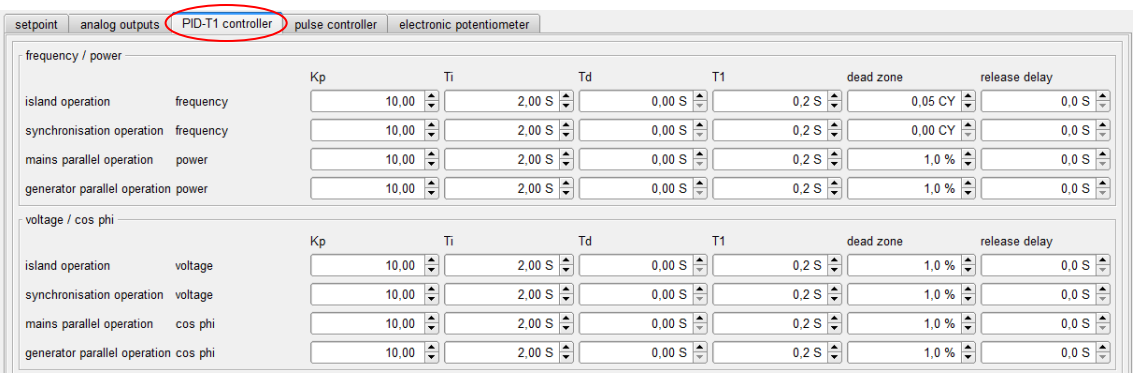
4.3.4.15 Analog outputs



Four analog outputs are available on the CPU module. Different functions can be assigned to these outputs. Depending on the functions the outputs can be scaled. The analog outputs 1+2 as well as 3+4 share a common potential. All four outputs are electrically isolated to the supply voltage.

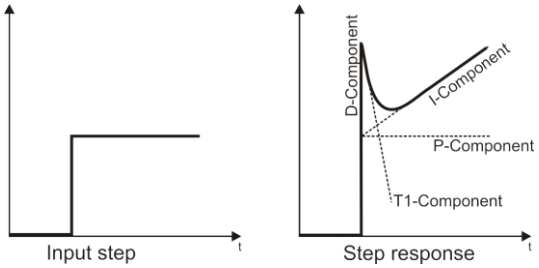
Analog outputs	
El.Poti 1 – frequency/power	Adjustment range will be entered at the panel under „Electr. Potentiometer“. The other regulation parameters are to be input via tab Controller→Pulse controller.
El.Poti 2 – voltage/Cos Phi	Adjustment range will be entered at the panel under „Electr. Potentiometer“. The other regulation parameters are to be input via tab Controller→Pulse controller.
PID-T1 – frequency/power	Input of adjustment range. Via „Offset“ the centre of the adjustment range can be moved. The other regulation parameters are to be input via tab Controller→PID-T1 controller.
PID-T1 – voltage/Cos phi	Input of adjustment range. Via „Offset“ the centre of the adjustment range can be moved. The other regulation parameters are to be input via tab Controller→PID-T1 controller.
Power %	Scaling of output range. For power control in genset parallel operation.
Power KW	Scaling of output range. For connection of a measurement device.
Cos phi	Scaling of output range. For Cos Phi control in genset parallel operation.

4.3.4.16 PID-T1 controller



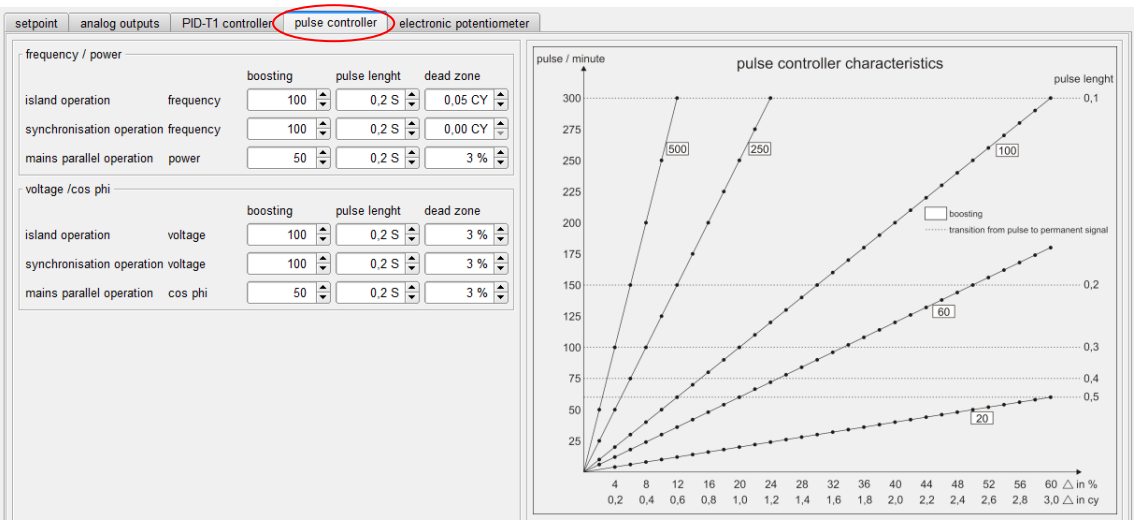
Settings for controller characteristics. Each operation condition has its individual settings. They will only be displayed if PID-T1 controllers are set to an analog output.

The PID-T1 controller settings affect the KSS controller characteristics. Different parameters can be entered for the operation conditions island mode, synchronization, generator and mains parallel operation and acc. to the controlled variable the output is done via the analog outputs. Two controllers are available. One controller is for frequency / power control, the other for voltage / Cos Phi control.



PID-T1 controller	
Kp	Proportional coefficient – The step response is following the trend of the input signal. Only the amplitude changes.
Ti	Integration time – control time, required from the output to reach the height of the controlled variable step at the input.
Td	Derivative action time – An input step leads to an output pulse.
T1	Time to delay signal drop. Reduces oscillation.
Dead zone	Within dead zone only control with P part.
Release delay	Release controller delay.

4.3.4.17 Pulse controller



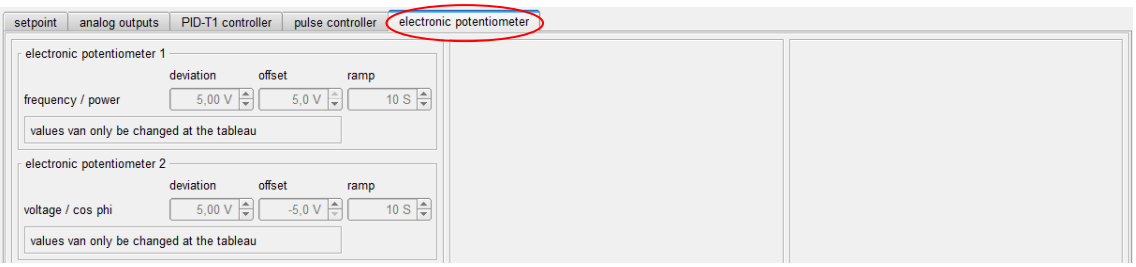
Settings for controller characteristics. Each operation condition has its individual settings. Controller settings affect the pulse controller (output via digital outputs), as well as the electr. potentiometer adjustments.

The pulse controller affects the KSS controller characteristics at the respective outputs. Different parameters can be entered for the operation conditions island mode, synchronization and parallel operation. The output is done acc. to the controlled variable via the digital outputs 'Decrease speed', 'Increase speed', 'Voltage lower' and 'Voltage higher'.

With the pulse controller characteristics various settings are shown for which deviation how many pulses have to be output, and when a continuous pulse occurs.

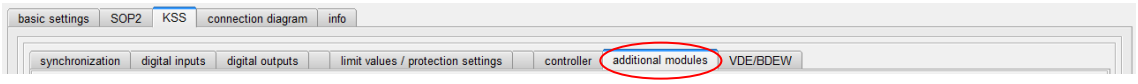
Pulse controller	
Boosting	Depending on the preset boosting value more pulses per minute will be output with increasing deviation. With the increasing number of pulses the pulse off time will be reduced. If the pulse off time is lower than the preset pulse length a permanent signal will be output.
Pulse length	Pulse length corresponds always to the preset value.
Dead zone	Controller is disabled within dead zone.

4.3.4.18 Electronic potentiometer

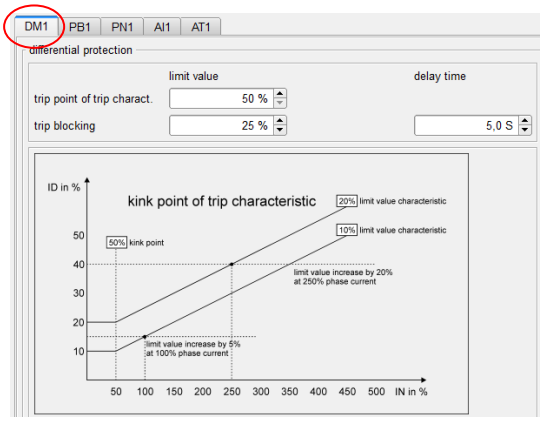


Input of electronic potentiometer values is only possible via panel. When visualizing the parameter data only the values input via panel are displayed.

4.3.5 Additional modules



4.3.5.1 DM1 modules



For adjustment of differential protection settings the DM1 module has to be enabled via tab „basic settings“. „Watchdog“ alarm will be tripped if the module is enabled but not connected to bus.

During operation, once the sampling interval is up, the measured values are compared with the preset limit values for pre-warning and cut-out. Upon reaching the limit values the corresponding error messages is displayed. If the phase current exceeds the infliction point, preset in a range from 50 to 500 %, the pre-warning and cut-out characteristics for the residual current are increased by 1 % per 10 % phase current above the kink-point.

If the limit is exceeded for trigger locked the trigger will be disabled for the duration of the delay time. The trigger lock can be also activated via a digital input (edge-triggered).

The differential protection function is to be used to protect three-phase rotary current generators or three-phase rotary current synchronous and asynchronous motors. It senses the residual currents within the protected zone, triggers when reaching the preset limit values and the corresponding error messages are displayed.

The differential protection measuring is the comparison of currents between generator star point and the outflow of generator or the supply in the switching gear. The sum of all currents must be zero.

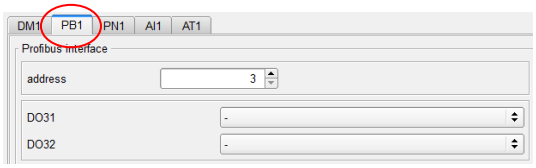
Three transformer circuits capture the current in the star point of the generator (internal electric circuit), three other transformer circuits are to be arranged by the customer and capture the consumer current (external electric circuit). The measuring in the six current paths in made as simultaneous sampling of all six measuring circuits with 16 samplings per cycle and path. For each current value the real effective value is calculated and evaluated once a cycle is up. The minimal disconnection delay amounts to approx. 130 ms.

The DM1 module offers two output relays permanently assigned to the alarms 113 and 114. To avoid accidental tripping, e.g. during start of large electrical drives, tripping can be suppressed for a set time.

If the residual current in one of the three phases is greater than the pre-selected limit value, the delay time starts to run. Once the delay time is up the appropriate error message is integrated into the SOP 2 display. In addition it is possible to link a digital output to the error message function. If the limit value falls below the preset hysteresis value, it automatically resets.

The difference between internal and external current is calculated from the instantaneous values of the currents, so that it is also possible to identify and evaluate a phase difference.

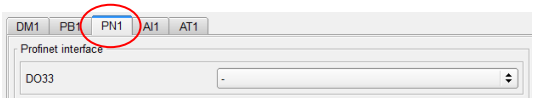
4.3.5.2 PB1 module



For adjustment of profibus coupling settings the PB1 module has to be enabled via tab „basic settings“. „Watchdog“ alarm will be tripped if the module is enabled but not connected to bus.

To connect with the PLC the correct address has to be set. The PB1 module offers two output relays to be assigned to functions according to the dropdown lists.

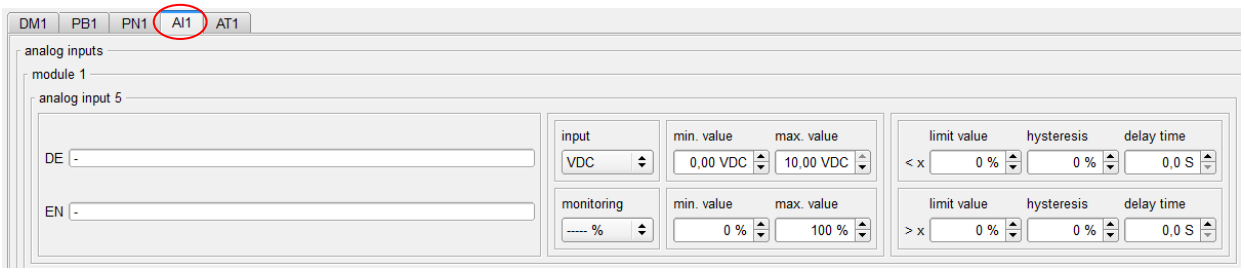
4.3.5.3 PN1 module



For adjustment of profinet coupling settings the PN1 module has to be enabled via tab „basic settings“. „Watchdog“ alarm will be tripped if the module is enabled but not connected to bus.

To connect with the PLC, the PLC must assign an address to the PN1 module. The PN1 module offer one output relays to be assigned to functions according to the dropdown lists.

4.3.5.4 AI1 module



6 analog inputs are available.

For adjustment of analog input settings the AI1 module has to be enabled via tab „basic settings“. „Watchdog“ alarm will be tripped if the module is enabled but not connected to bus.

Each input is assigned to an error message. For adjustment please refer to tab „Limit values/Protection settings →Analog inputs“.

For each input or a current or a voltage signal can be selected. The input signal operating range is set via start and stop value.

Input	
VDC	Operating range from -10VDC to +10VDC.
mA	Operating range from -20mA to +20mA.

Depending on the selected display mode the analog values will be visualized on the panel via menu item „Analog values“. Depending on the input signal operating range the displayed values can be scaled with start and stop value. 7 different display units are available. If the panel analog value should not be displayed a „-“ character has to be input.

Monitoring	
----- % or ----,- %	5-digit in percent stelling in Prozent
----- liter	5-digit in liter
----- bar or ---,- bar	5-digit in bar
----- C° or ----,- C°	5-digit in C°
----- rpm	5-digit in rpm
----- VDC or ----,- VDC	5-digit in VDC
----- ADC or ----,- ADC	5-digit in ADC

Furthermore there are two adjustable limit values available for selection for each input.

Limit value	
< x / > x	When falling below or exceeding the limit value and after expiration of the delay time the respective output relay will be activated.

4.3.5.5 AT1-Modul

It is a measurement module available with 6 PT100(0) inputs and two analog inputs. The description is an example at the analog input 1 on the module 1.

For adjustment of the PT100(0) measurement inputs the module has to be enabled via tab „basic settings“. „Watchdog“ alarm will be tripped if the module is enabled but not connected to bus.

Two error messages are assigned to each input. For adjustment please refer to tab „Limit values/Protection settings →PT100(0)“.

For the PT100(0) measuring inputs selection is possible between PT100 and PT1000.

For each input or a current or a voltage signal can be selected. The input signal operating range is set via start and stop value.

Input	
PT100	Working range -50°C to 220°C
PT1000	Working range -50°C to 220°C
VDC	Working range -10VDC to +10VDC
mA	Working range -20mA to +20mA

The display is always in °C.

Monitoring PT100(0)	
----- C° or ----,- C°	4 digits in C°

Depending on the selected display mode the analog values will be visualized on the panel via menu item „Analog values“. Depending on the input signal operating range the displayed values can be scaled with start and stop value. 7 different display units are available. If the panel analog value should not be displayed a „-“ character has to be input.

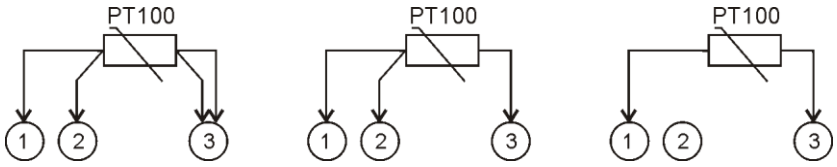
Monitoring analog input	
----- % or ----,- %	5 digits in percent
----- Liter	5 digits in liter
----- bar or ---,- bar	5 digits in bar
----- C° or ----,- C°	5 digits in C°
----- rpm	5 digits in rpm
----- VDC or ----,- VDC	5 digits in VDC
----- ADC or ----,- ADC	5 digits in ADC

Furthermore there are two adjustable limit values available for each input.

Limit value	
< x / > x	When falling below or exceeding the limit value and after expiration of the delay time the respective output relay will be activated.

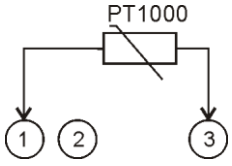
4.3.5.6 PT100(0) connection examples

Connection examples for the PT100 on measurement input 1

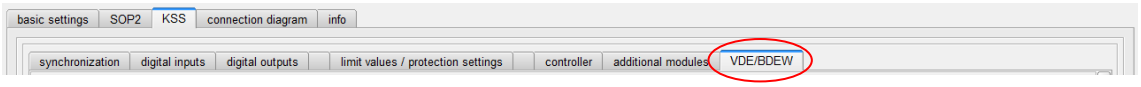


4-wire 3-wire 2-wire

Connection example for the PT1000 on measurement input 1

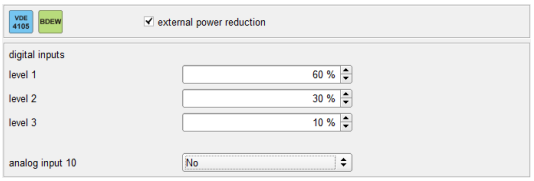


4.3.6 VDE/BDEW



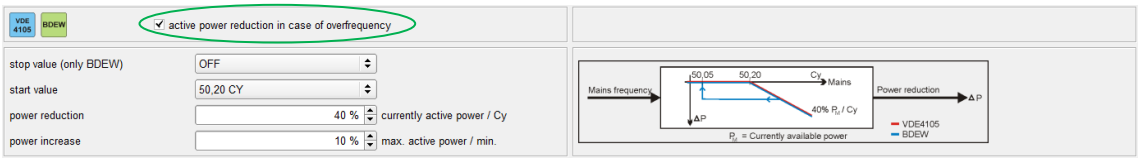
A selection of functions required by VDE4105 (VDE=Association for Electrical, Electronic & Information Technologies) or BDEW (German Association of Energy and Water Industries).

4.3.6.1 External power reduction



In mains parallel operation the system operator may require an external power reduction. This reduction is done with a setpoint value in steps or continuously. The steps are freely configurable via three digital inputs, or continuously limited via analogue input 10. Digital inputs are controlled with a continuous signal or via pulse. If the setpoint values are input via pulses Reset must be assigned to a fourth digital input. The system will be 100% ready for operation with Reset set, resp. no more continuous signal. If the power reduction is done with a continuous signal, always the lowest selected level is set. A -10 to +10VDC signal can be assigned to the analogue input. The input signal is freely configurable. If the pre-set setpoint value is not reached within five minutes, Alarm 103 will be displayed.

4.3.6.2 Active power reduction in case of overfrequency

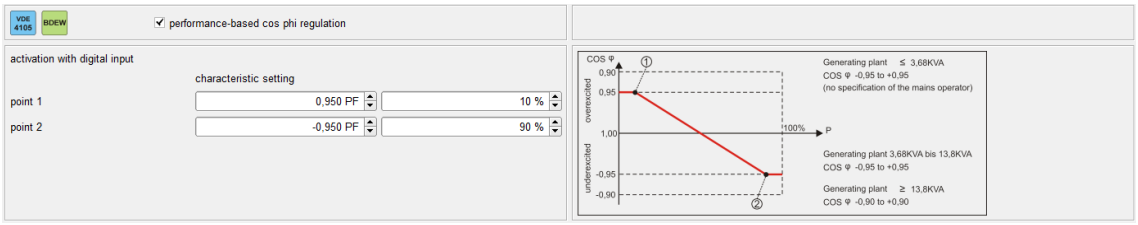


This function has to be enabled. In the operation, there are differences between VDE4105 and BDEW.

VDE4105 - In case of a mains frequency exceeding 50,2Hz, in mains parallel operation, the currently generated active power will be „frozen“. If the frequency continues to rise 40% of this „frozen“ power will be decreased or increased per Hertz. In the frequency range between 50.2 Hz and 51.5 Hz, the active power moves permanently on the curve up and down ("driving on the curve"). If mains frequency falls again below the value of 50,2Hz (stop value setting is “OFF”), and the power setpoint value exceeds the „frozen“ active power, it will be adjusted in 10% steps to the maximum active power per minute. Active power reduction is limited to 0%.

BDEW - In case of a mains frequency exceeding 50,2Hz, in mains parallel operation, the currently generated active power will be „frozen“. If the frequency continues to rise 40% of this „frozen“ power will be decreased per Hertz. The active power can be increased only when you return to a value of ≤ 50.05 Hz again (stop value setting is “50.05 Hz”). The gradient of the active power may be increased to the set point is adjustable. Active power reduction is limited to 0%.

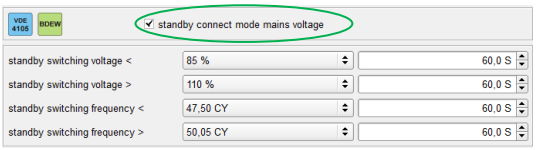
4.3.6.3 Performance-based Cos φ regulation



This function is activated via digital input.

Depending on the increasing active power the Cos Phi setpoint value changes from the inductive to the capacitive range. There are two configurable points to fix the characteristic curve. The settings of the regulation speed correspond to the settings of the Cos Phi controller.

4.3.6.4 Standby connect mode mains voltage



This function has to be activated. If this function should not be enabled permanently it is possible to lock it via a digital output parameterized accordingly.

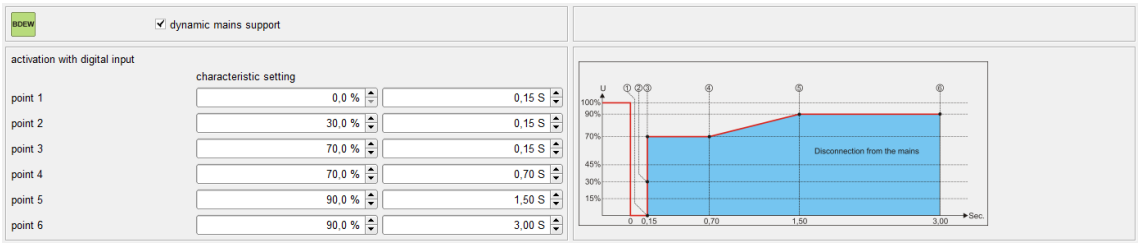
Mains connection is only established if mains voltage and mains frequency are in certain ranges of tolerance. These ranges differ in VDE4105 and BDEW.

VDE4105 – A connection or reconnection is allowed only if the mains voltage has to be between 85% and 110% of the rated voltage and the frequency between 47,5Hz and 50,05Hz. The mains voltage must be located over a period of at least 60 seconds within these tolerances.

BDEW – A connection or reconnection is allowed only if the mains voltage is at least 95% the rated voltage and the frequency between 47,5Hz and 50,05Hz.

Additionally connection release can be output via a digital output. The contact can be used as NC or NO. If the ranges for voltage and/or frequency are left for up to three seconds, another connection is possible even if the tolerance ranges are kept for only five seconds without interruption. As long as standby connect mode has not been released the LED „Mains voltage available“ is flashing.

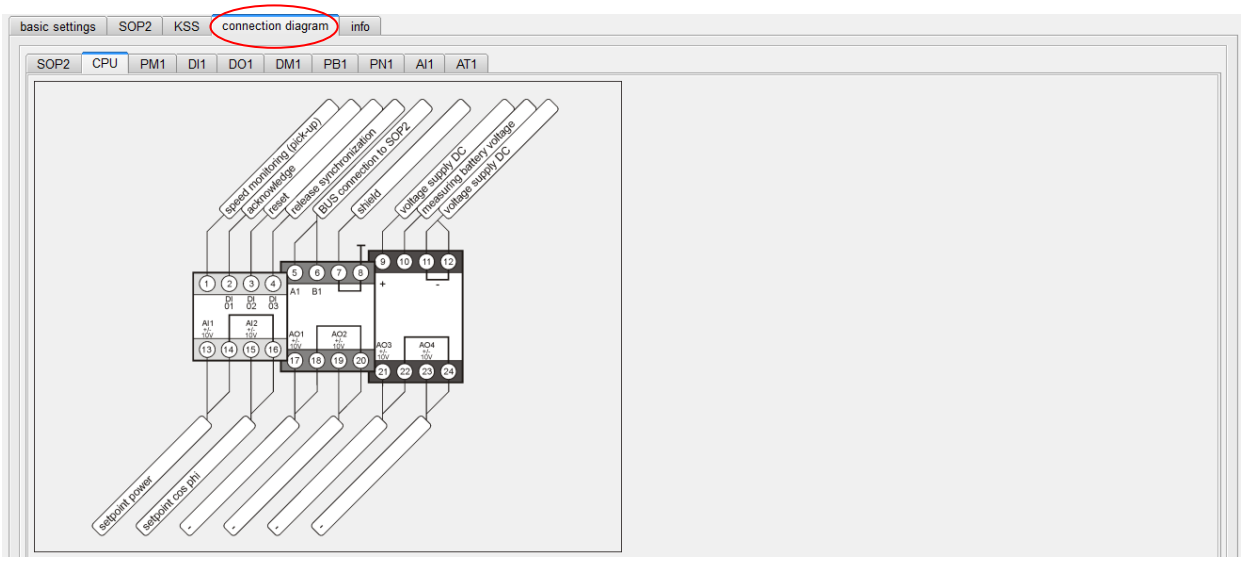
4.3.6.5 Dynamic mains support



This function is enabled via a digital input parameterized accordingly.

The dynamic mains support has been designed for voltage continuity in case of mains voltage dips. For a certain period after mains breakdown it is made sure that connection to mains is not cut. Connection to mains will be cut if the voltage has not increased to the set value within the set time. The voltage time curve has to be set with six points. Alarm 61 and 62 are for the control of the characteristic setting.

4.4 Connection diagram



Connection diagram for all available modules.

4.5 Info

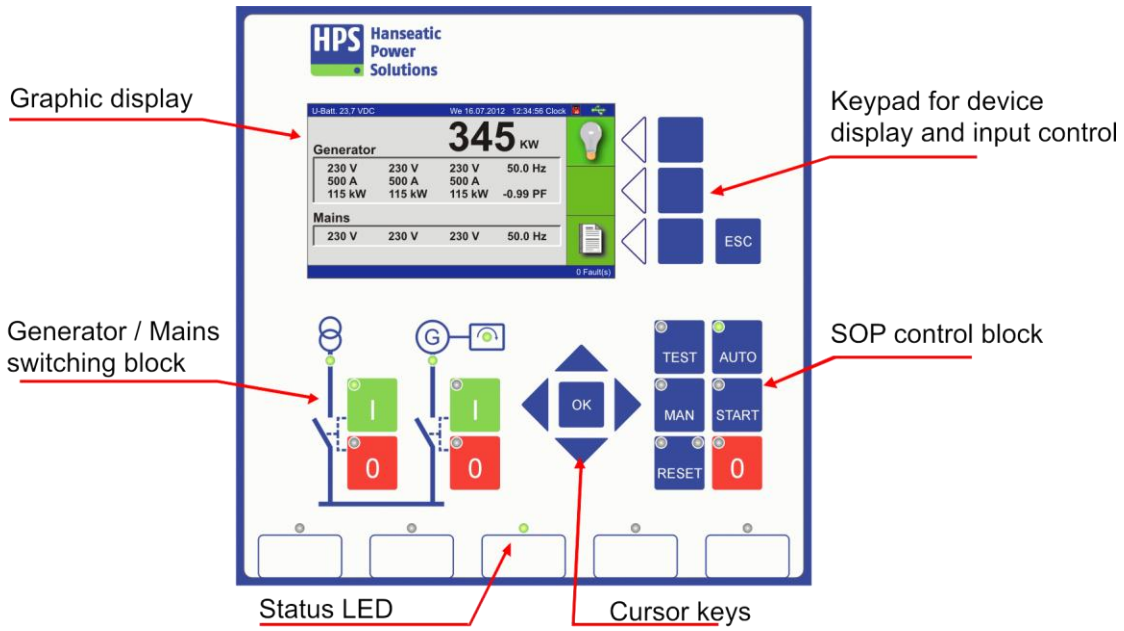
Three information windows for free text input are available. Input texts can be displayed via panel menu item „Info“.

5 SOP 2 operation

Direct operation of the KSS protection device is done via display and operation device SOP 2. Further control options are available via input functions. For device parameterization, also to be done via SOP 2, it is recommended to use the configuration software 'Device Management 2'.

5.1 Overview

The following figures are exemplary; they may differ acc. to device variant, intended use and firmware version of the respective device. As a warranty for completeness the controls will be described for the panel variant NG.



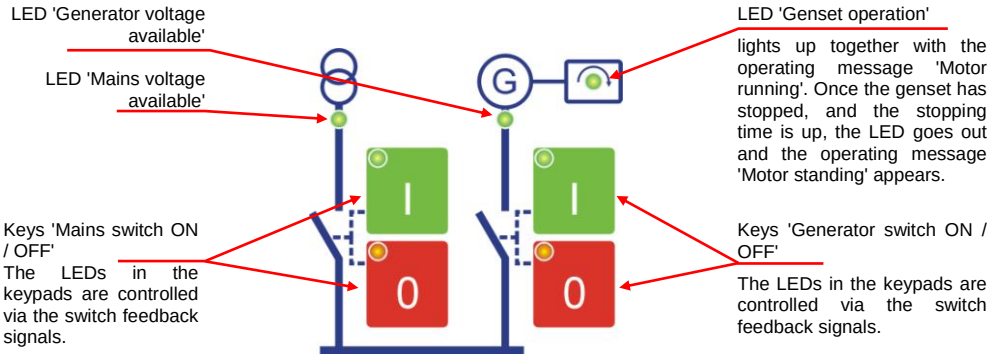
5.2 Keys, symbols and their functions

For all displayed information please use the keypad for display control and the cursor keys.

Key	Description
	Three keys for display control. The relevant function (*meaning see below*) is shown on the graphic display to the left of the respective key.
	During parameter setting the cursor keys navigate you through the input values (arrow keys), and are also used for their modification as well as input acknowledgement (OK key).
	The ESC key aborts the currently active process. When navigating through the menus the ESC key is for selecting the previous menu. Using the ESC key will discard all modifications done in the active menu.

Symbol	Function / Meaning
	UP key – function for scrolling (up) through all screens, resp. the displayed menu items.
	DOWN key – function for scrolling (down) through all screens, resp. the displayed menu items.
	Menu selection – function for switching from standard display mode to menu display mode (e.g. for device parameter setting).
	The Enter key confirms the selection of a menu item.
	Lamp test for the panel LEDs. Press key for approx. 1 sec.
	This symbol visualizes the current connection status with an inserted SD card (*see Chap. 5.3*);
	The USB symbol indicates the connection SOP 2 – PC system.
	If the cursor key symbol is displayed the inputs for the relevant menu item have to be done with the cursor keys.

5.2.1 Generator / Mains switching block



5.2.2 SOP control block

The keys / LEDs combined in this group are for the direct control and operating modes' reselection of the compact automatic.

Key	Description
	With this key the operation mode 'Test' is selected. In this operating mode the genset will be automatically started and controlled. The genset runs without load. Keys for mains and generator switches are active, for manual on/off switching. In case of a mains failure while running in test mode an automatic emergency operation. Change back to mains supply after mains returns can be done manually or by selecting the operation mode 'Automatic'.
	With the selection of 'Automatic' mode the automatic operating mode of the respective control is initiated. In case of the mains-generator control (NG) the genset is prepared for automatic start. In the event of power failure this leads to automatic replacement power operation. The genset is automatically started, the mains switch release is cancelled and the generator switch release is set. The consumer loads are supplied by the generator. Upon mains return the loads are automatically set to the mains, the genset is stopped after a cooling run.
	With the key 'MAN' (manual) manual operation is selected. In this operating mode the genset can only be stopped with the 0 key. The control does not respond to a power failure. All switching has to be done manually via the mains and generator switch keys.
	The 'START' key is only active in manual operating mode ('MAN'). Genset is started.
	This key is for acknowledging and resetting of error messages. The yellow LED indicates a warning error message, in case of a disconnecting error message yellow and red LEDs are flashing simultaneously. By pressing the 'RESET' key for the first time (Acknowledge error message) the LEDs switch to constant light, the acoustic alarm signal (Horn) is switched off. If the failure is eliminated pressing the key for the 2nd time results in the LEDs going out, and the error messages are not displayed anymore. If the failure is not eliminated, pressing the 'RESET' key for the 2nd time results in setting the horn again, and the LEDs start flashing again.
	With the selection of the operating mode 'Off' (key '0') the generator switch is switched off and the genset is stopped. Furthermore a general mains switch release is set, and is switched on when there is mains power available.

5.2.3 Status LED

The 5 LEDs at the rear side of the panel can be controlled directly from the PLC, in order to easily indicate e.g. operating messages. Below the LED you find a labelling area to put a short information (with a permanent marker or sticker) regarding the individually assigned function.

5.3 SD card

The use of an SD card in the SD card slot, accessible at the upper part of the enclosure backside of the SOP 2, offers a variety of additional options.

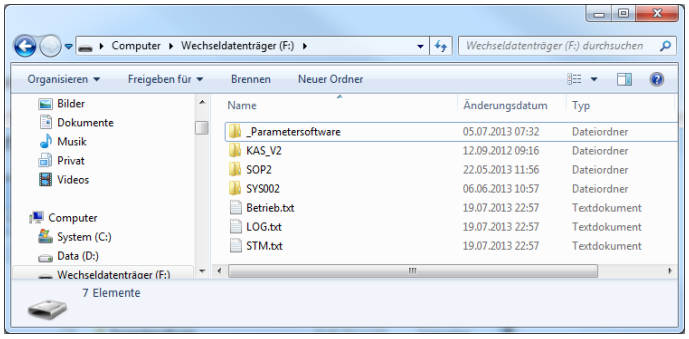
5.3.1 Use of the SD card as a mass storage device

If there is a connection between SOP 2 and a PC system, it is possible to select the SD card upon insertion as mass storage device for the connected PC system. In this case the SD card will be shown as an additional drive on the user interface of the PC system, and the SOP 2 represents the SD card reader.

Note: If the SD card is used as a mass storage device it is locked for all access via compact automatic. In this case the protocol files are not updated. The SOP is only able to cope with memory cards up to a size of max. 4GB.

5.3.2 Contents of the SD card

The SD card, part of the scope of supply of the compact automatic, contains the following files and directories, visible via PC:



- The directory 'SOP2→FAC_DIR' includes the file 'SOP2_FAC.fmt'. This file contains the parameter data set at the time of delivery of the switchboard. Therefore this file enables the reset of the switchboard to its status at the time of delivery.
- The directory 'SOP2→STD_DIR' contains the current configuration file 'SOP2_STD.fmt' of the KSS, this file is updated with a backup function each time the settings are modified. The backup function guarantees storage of previous settings, and enables reset of the switchboard to previous versions in case of modifications.
- The directory 'Parametersoftware' includes the file 'HPS_GV2_Install_*JJJJMMTT*.exe' (the character string *JJJJMMTT* means the release date: J = Jahr/Year, M = Monat/Month, T = Tag/Day). Double clicking on the file icon (or selection via the context menu 'open') starts the installation of the parameter setting software 'Device management 2'; this software enables comfortable setting parameter edition for the compact automatic via PC.

  System requirements for the installation are: MS Windows operating system, a minimum of 60 MB hard disk memory available. For data transfer a USB connecting cable (A : Mini-B) or a 1:1 extension cable SUB-D 9-pol. is required..
- The directory SYS002 contains manufacturer-specific information; these data may only be changed by the user upon instruction from the manufacturer.
- The files 'Betrieb.txt', 'LOG.txt' and 'STM.txt' (the file name extension '.txt' may be hidden, depending on the respective PC operating system settings) are part of the SD card master directory and can be opened with any text editor; they contain data for switchboard operation (Betrieb.txt), event protocols (LOG.txt), and a list of all error messages.

5.3.3 Backup and recovery functions

For backup and reset to the delivery status the following functions are available:

5.3.4 Back-Up function

After each reset the SOP 2 stores the current settings in a file named 'SOP2-STD.fmt', this file is saved in the directory 'SOP2_DIR'. If there is already an existing file with the same name, this file is renamed first as a backup file as follows: '*JJMMTT_hhmmss*.fmt' (the file name indicates the date of renaming: J = Jahr/Year, M = Monat/Month, T = Tag/Day, h = Stunde/Hour, m = Minute, s = Sekunde/Second). It is possible to use the file 'SOP2_STD.fmt' for reset of all current settings in the SOP 2.

Note: A reset happens after modification of data in the edit menu, transfer of parameter data from a PC, or the SOP2 restart after power failure. Renaming an older backup file, from e.g. '120807_115338.fmt' to 'SOP2_STD.fmt' enables the recovery of earlier parameter setting versions

5.3.5 Reset to current settings

Switch off supply voltage with inserted SD card. Press the upper key ■ and turn on again the supply voltage. The file 'STD_FILE.FMT' will be imported into the compact automatic.

5.3.6 Reset to delivery status

Switch off supply voltage with inserted SD card. Press the middle key ■ and turn on again the supply voltage. The file 'FAC_FILE.FMT' will be imported into the compact automatic.

5.3.7 SD card status display

The status of an SD card inserted in the SOP 2 SD card slot, correctly detected by the device, will be displayed as follows:


The SD card has been accepted and can be used from the SOP 2.


The SD card has been accepted but is temporarily locked, i.e. current write access by the SOP 2 or use of the card as mass storage device. When this status is displayed do not remove the SD card.


The SD card cannot be used by the SOP 2.

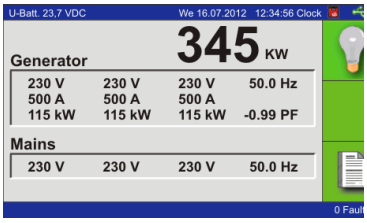
6 SOP2 functions

The display and operating device SOP 2 has a high-resolution graphic display, providing the user with a quick overview of the device status and an easy input control.

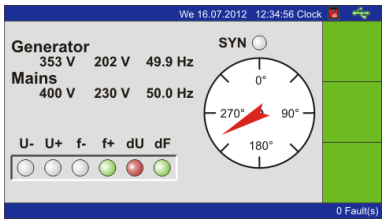
A keypad, located beside the display, controls the display contents and enables navigation for parameter inputs. For each key the corresponding function is visualized in the green area of the graphic display.

The SOP 2 display shows different areas, the displayed contents differ acc. to application or display mode. Header and Footer (blue) visualize the currently displayed contents (Screen / Menu), date and time, as well as status information regarding connected devices, operation mode and error messages. The central area (grey) visualizes the respective current values, and the area to the right (green) indicates the corresponding function for each key.

After switching on the compact automatic and the following initialisation the start screen will be displayed on the SOP2. With the ESC key it is always possible to return to this start screen.



Start screen
Two views are available. Selection is done via the parameter program.

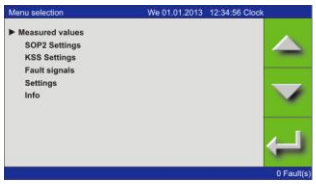


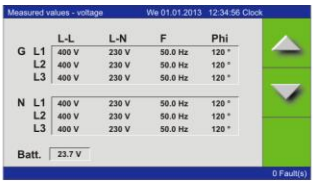
The SYN screen can **NOT** be selected with the arrow keys. During active synchronization the screen is automatically displayed, and as well automatically faded out after synchronization.

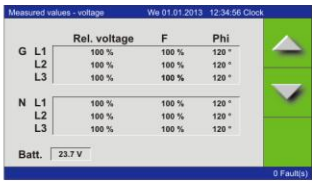
6.1 Menu selection

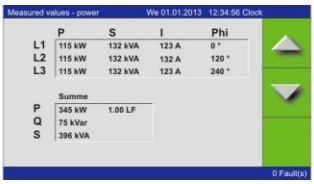
Menu selection is opened with this key. Scrolling through this menu is done with the Up and Down arrow keys. ENTER opens the selected menu item. For submenus selection is done the same way.

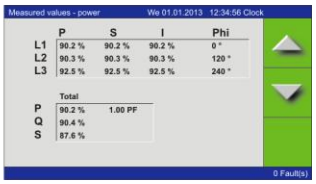
6.2 Measured values

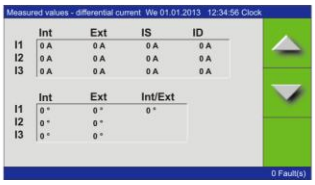


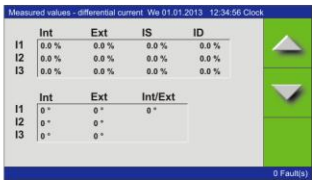








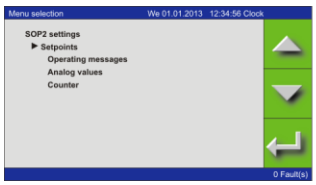


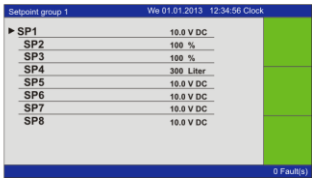


Six screens are available. The selection which screen will be displayed is done via the parameter program – Measured values.

6.3 SOP2 settings

6.3.1 Setpoints

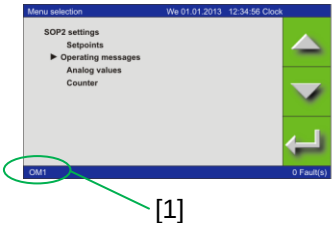




Screens of Setpoint values‘ Group 1 – Groups 2 to 8 are structured the same.

The setpoints can be input via the cursor field, texts and units via the parameter software.

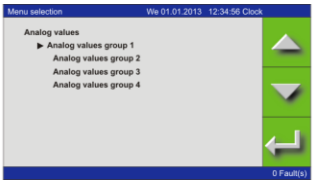
6.3.2 Operating messages

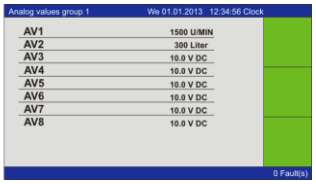


Screens of Operating messages‘ Group 1 – Groups 2 to 4 are structured the same.

The active operating messages are symbolized by a green LED. Disabled operating messages are grey. All messages enabled in the parameter software [1] will be displayed in the status line as long as they are active.

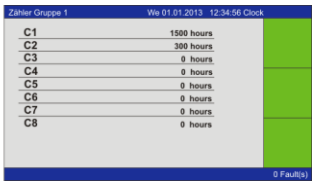
6.3.3 Analog values





Screens of Analog values‘ Group 1 – Groups 2 to 4 are structured the same. Texts and units are input via the parameter software.

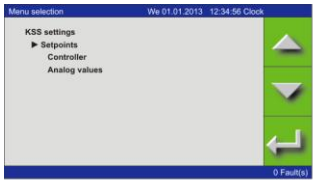
6.3.4 Counter

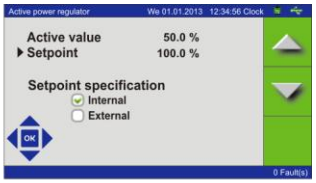


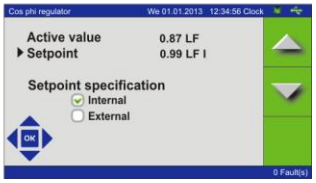
Screens of Counters‘ Group 1 – Groups 2 to 4 are structured the same. Texts and units are input via the parameter software.

6.4 KSS settings

6.4.1 Setpoints







Setpoints can be set for two different regulators. For the setpoint specification selection is possible between the setpoint adjusted at the panel (internal) or the analog value (external). When not activated via parameterization the menus for these regulators are greyed out and cannot be selected.

6.4.2 Controller

6.4.2.1 Electr. Potentiometer

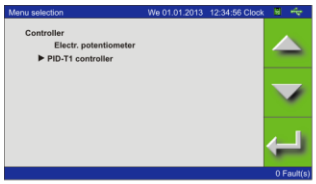
Two electronic potentiometers are available. The potentiometers have to be assigned to an analog output to be able to do adjustments via panel. The internal signals of the pulse controller influence the adjustment of the electr. potentiometers. Setting of the adjustment range of the electr. potentiometer is solely done via SOP 2. However the values can be read and displayed with the configuration software Device Management 2.

- Offset : Basic voltage value at analogue output, the output will be reset to this value when the speed governor is reset (e.g. in case of Gen. CB – OFF, start and stop command).
- Ramp : Setting of the delay for voltage variation at analogue output;
- Deviation : Input of adjustment range (+/-) with reference to the Offset value.

For test purposes manual adjustment can be activated. If manual adjustment is active the output can be set manually with the Plus / Minus keys. Manual reset is possible with this key: .

Attention: During manual adjustment the automatic control is disabled, regulation has to be done by the operator at the SOP 2. After leaving manual adjustment with the „ESC“ key the automatic adjustment is enabled again.

6.4.2.2 PID-T1



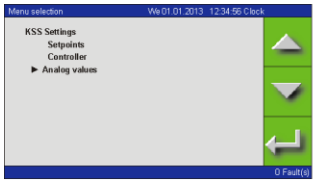
The two available PID-T1 controllers have to be assigned to an analog output. Setting of the adjustment range is solely done via the parameter software.

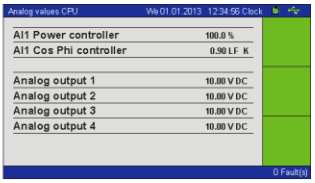
For test purposes manual adjustment can be activated. If manual adjustment is active the output can be set manually with the Plus / Minus keys. Manual reset is possible with this key:  .

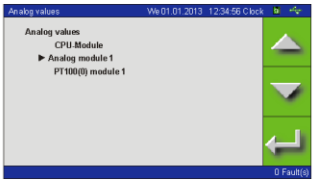
Attention: During manual adjustment the automatic control is disabled, regulation has to be done by the operator at the SOP 2. After leaving manual adjustment with the „ESC“ key the automatic adjustment is enabled again.

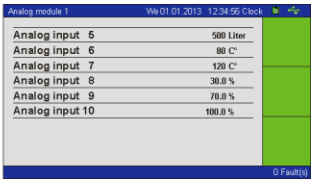
If the input "Lock setpoint control U / F" is set, the automatic control of the island and synchronization mode is disabled. The corresponding controller output can about the input functions "speed down", "speed up", "voltage down" and "voltage up" be changed.

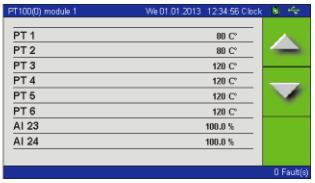
6.4.3 Analog values











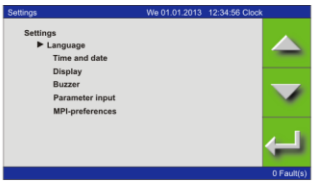
The analog values of the CPU module are always available. The selection of analog input modules and the PT100(0) modules is only visible with the module activated. The windows show the measured values with the selected unit.

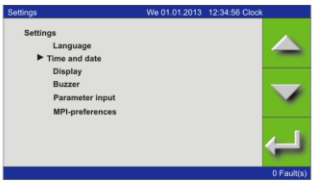
6.5 Fault signals

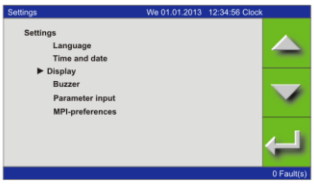
All pending error messages are listed in the screen „Current fault“. If there are more than 4 alarms pending, it is possible to browse them by blocks. The upper status bar [1] displays the total number of alarm messages pending, and visualizes the block just browsed.

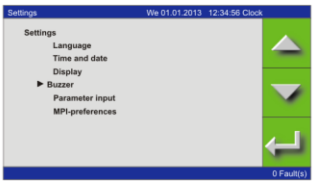
All alarms are stored with date and time in the error message memory, and additionally on the SD card.

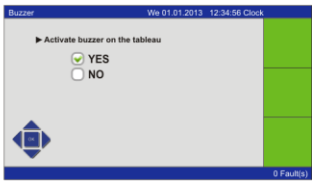
6.6 Settings

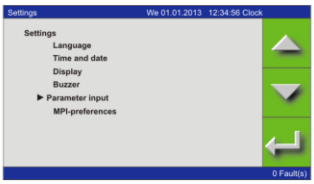


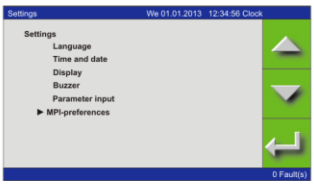


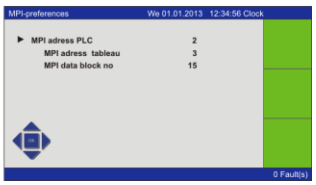












6.6.1 Language

Language selections for the displayed texts. Default languages are German and English.

6.6.2 Time and date

Setting of time and date in order to enable correct chronological recording of all locked entries in the fault message memory. If a data base is loaded to the SOP2 synchronization with PC date and time will be possible.

Date and time will be stored for approx. 72 hs in case of a voltage drop. The buffering takes a gold cap condenser because it is maintenance-free.

6.6.3 Display

Settings for brightness and display time (min. 10 sec.), to dim or switch off the display when inactive. The display is reactivated via a keystroke or it as reactivated with incoming messages.

6.6.4 Buzzer

The buzzer, avaible on the panel, may be disabled.

6.6.5 Parameter input

If there is no PC available all parameters can also be adjusted directly at the SOP2. The input is protected by a PIN.

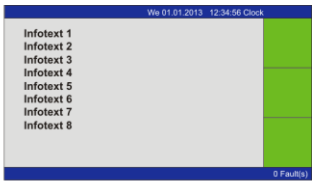
Acc. to the parameter list the 3-digit parameter number has to be input (xx:xxx:xx), to be able to modify the parameter.

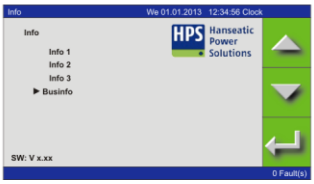
In parameters 10:xxx:01 and 10:xxx:02 the alarm texts for both languages can be edited. To simplify text editing there are three default values. Letters, numbers and a blank space.

6.6.6 MPI settings

Settings for data PLS communication via MPI interface.

6.7 Info





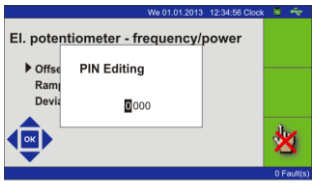
Three information windows are available. All texts input via the device management „Info“ tab will be displayed.

The modules set in the project will be monitored via menu item Businfo. If all modules are working without error the text message displays „OK“. If one of the modules doesn’t work anymore the name of this module will be visualized.

7 PIN protections

Several panel input modes are protected with a PIN number. Modification of this PIN is only possible via panel.

7.1 PIN edit mode



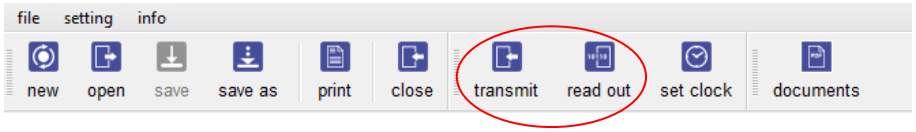
PIN number 9000

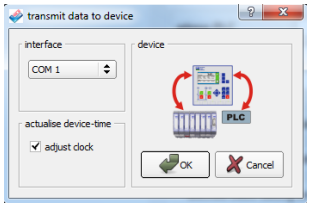
The PIN number 9000 has to be input to modify the electr. potentiometers or parameters.

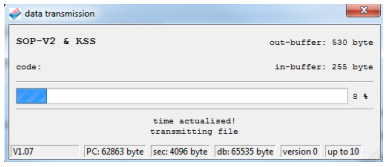
8 SOP2 / KSS configuration

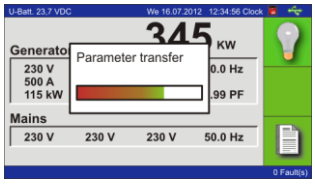
In order to meet each possible application the respective parameterization is required. Before commissioning the nominal values have to be set, i.e. rated voltage, rated current and rated power, as well as the trip values for the alarm and protection settings. All settings are stored in a flash memory, and are also kept in case of power failure.

8.1 PC configuration









For data transmission to SOP2 / KSS the operating mode „0“ has to be selected at the panel.

The PC will be connected to the panel via a serial 1:1 cable.

Transmission mode will be opened with the button „transmit“. After interface selection transmission will be started with the „OK“ button. During transmission the PC and the panel will show a progress bar.

After transmission the panel will do a reset and will then be in normal operating mode.

Panel project read out is done the same way.

8.2 Tableau configuration

Only KSS parameters can be edited via panel. SOP2 parameter data have to be edited via the configuration program.

For parameter edition the menu Parameter input has to be opened in item Settings.

SOP edition with the help of the cursor keys the position of the value to be modified will be selected in the upper line of the displayed dialogue.

Positions selection has to be confirmed with OK and the value to be adjusted will be selected. Modification has also to be confirmed with „OK“. Parameter input is left with the „ESC“ key. All modified values are now stored safely.

With the help of the parameter list it is possible to modify all parameters via panel.

8.2.1 Parameter list

[1] Analog inputs

	Description	:03	:04	:05	:06	:07	:08	:09
01:001:__	AE01 Power controller	1	0	1000	0	1000	0	0
01:002:__	AE02 Cos Phi controller	2	0	1000	0	1000	0	0
01:003:__	-	0	0	1000	0	1000	0	0
01:004:__	-	0	0	0	0	0	0	0
01:005:__	AE05 – AI1 Module (ADR0)	0	0	1000	0	1000	0	0
01:006:__	AE06 – AI1 Module (ADR0)	0	0	1000	0	1000	0	0
01:007:__	AE07 – AI1 Module (ADR0)	0	0	1000	0	1000	0	0
01:008:__	AE08 – AI1 Module (ADR0)	0	0	1000	0	1000	0	0
01:009:__	AE09 – AI1 Module (ADR0)	0	0	1000	0	1000	0	0
01:010:__	AE10 – AI1 Module (ADR0)	0	0	1000	0	1000	0	0
01:011:__	-	0	0	1000	0	1000	0	0
01:012:__	-	0	0	1000	0	1000	0	0
01:013:__	-	0	0	1000	0	1000	0	0
01:014:__	-	0	0	1000	0	1000	0	0
01:015:__	-	0	0	1000	0	1000	0	0
01:016:__	-	0	0	1000	0	1000	0	0
01:017:__	-	0	0	1000	0	1000	0	0
01:018:__	-	0	0	1000	0	1000	0	0
01:019:__	-	0	0	1000	0	1000	0	0
01:020:__	-	0	0	1000	0	1000	0	0
01:021:__	-	0	0	1000	0	1000	0	0
01:022:__	-	0	0	1000	0	1000	0	0
01:023:__	PT1 – AT1 Module (ADR0)		0	100	0	0	0	88
01:024:__	PT2 – AT1 Module (ADR0)		0	100	0	0	0	88
01:025:__	PT3 – AT1 Module (ADR0)		0	100	0	0	0	88
01:026:__	PT4 – AT1 Module (ADR0)		0	100	0	0	0	88
01:027:__	PT5 – AT1 Module (ADR0)		0	100	0	0	0	88
01:028:__	PT6 – AT1 Module (ADR0)		0	100	0	0	0	88
01:029:__	AE23 – AT1 Module (ADR0)		0	100	0	1000	0	83
01:030:__	AE24 – AT1 Module (ADR0)		0	100	0	1000	0	83
01:031:__	-	0	0	100	0	0	0	88
01:032:__	-	0	0	100	0	0	0	88
01:033:__	-	0	0	100	0	0	0	88
01:034:__	-	0	0	100	0	0	0	88
01:035:__	-	0	0	100	0	0	0	88
01:036:__	-	0	0	100	0	0	0	88
01:037:__	-	0	0	100	0	1000	0	83
01:038:__	-	0	0	100	0	1000	0	83
01:039:__	-	0	0	0	0	0	0	0
01:040:__	-	0	0	0	0	0	0	0
01:041:__	-	0	0	0	0	0	0	0
01:042:__	-	0	0	0	0	0	0	0
01:043:__	-	0	0	0	0	0	0	0
01:044:__	-	0	0	0	0	0	0	0
01:045:__	-	0	0	0	0	0	0	0
01:046:__	-	0	0	0	0	0	0	0

	Do not modify input fields

:03	Function no.	
:04	Scaling of SOP display	Start value
:05	Scaling of SOP display	Final value
:06	Scaling of input signal	Start value
:07	Scaling of input signal	Final value
:08	Selection of input signal	VDC [0] / mA [1]
:09	Selection of unit to be displayed	See parameterization KSS

[2] Analog outputs

	Description	:03	:04	:05	:06	:07	:08	
02:001:__	Analog output 1	3	0	1000	0	1000	0	
02:002:__	Analog output 2	0	0	1000	0	1000	0	
02:003:__	Analog output 3	6	0	1000	0	1000	0	
02:004:__	Analog output 4	7	-	-	-	-	0	

	Do not modify input fields

:03	Function no.	[0] without function [3] Electr. Poti 1 – frequency/power [4] Electr. Poti 2 – voltage/Cos Phi [5] power in % [6] power in KW [7] Cos Phi [8] PID-T1 – voltage/Cos Phi [9] PID-T1 – frequency/power
:04	Scaling of SOP display	Start value
:05	Scaling of SOP display	Final value
:06	Scaling of input signal	Start value
:07	Scaling of input signal	Final value
:08	Without function	

[3] Digital inputs

	Description	:03		
03:001:__	DI001	34	CPU Module	Acknowledge
03:002:__	DI002	33	CPU Module	Reset
03:003:__	DI003	72	CPU Module	Release Syn.
03:004:__	DI101	76 / 67	DI1 Module (ADR0)	Load / Unload
03:005:__	DI102	53	DI1 Module (ADR0)	Speed up
03:006:__	DI103	52	DI1 Module (ADR0)	Speed down
03:007:__	DI104	71	DI1 Module (ADR0)	Speed controller reset
03:008:__	DI105	82	DI1 Module (ADR0)	Release mains U/F </<<
03:009:__	DI106	83	DI1 Module (ADR0)	Release generator U/F </<<
03:010:__ to 03:014:__	DI107 to DI111	0	DI1 Module (ADR0)	Free programmable
03:015:__	DI112	47	DI1 Module (ADR0)	Lock setpoint U/F
03:016:__	DI113	49	DI1 Module (ADR0)	Lock load control
03:017:__	DI114	70	DI1 Module (ADR0)	Lock cos phi control
03:018:__	DI115	75	DI1 Module (ADR0)	Lock current protection
03:019:__	DI116	77	DI1 Module (ADR0)	Lock differential protection
03:020:__	DI117	79	DI1 Module (ADR0)	Lock mains protection
03:021:__	DI118	81	DI1 Module (ADR0)	Lock all tripping
03:022:__ to 03:023:__	DI119 to DI120	0	DI1 Module (ADR0)	Free programmable
03:024:__	DI121	73 / 60	DI1 Module (ADR0)	Mains CB indication/Parallel operation
03:025:__	DI122	74	DI1 Module (ADR0)	Gen CB indication
03:026:__ to 03:071:__	-	0	-	-

	Do not modify input fields

:03	Selection of input functions acc. to function no.	see Item 4.3.2

[4] Digital outputs

	Description	:03		
04:001:__	DA001	168	PM1 Module	Mains fault
04:002:__	DA002	169	PM1 Module	Generator voltage available
04:003:__	DA003	81	PM1 Module	Mains protection collective fault
04:004:__	DA004	171	PM1 Module	Syn pulse
04:005:__	DA005	81	PM1 Module	Mains protection Mains CB – NO
04:006:__	DA006	81	PM1 Module	Mains protection Gen CB – NC
04:007:__	DA007	135	PM1 Module	Collective fault
04:008:__	DA008	184	PM1 Module	Watchdog (NC)
04:009:__	DA011	113	DM1 Module	AL241 Diff current >
04:010:__	DA012	114	DM1 Module	AL242 Diff current >>
04:011:__ to 04:015:__	Without function	0	-	-
04:016:__	DA031	0	PB1 Module	Free programmable
04:017:__	DA032	0	PB1 Module	Free programmable
04:018:__	Without function	0	-	-
04:019:__	Without function	0	-	-
04:020:__ to 04:029:__	DA101 to DA110	0	DA1 Module (ADR0)	Free programmable
04:030:__	DA111	39	DA1 Module (ADR0)	AL167 Supply UDC <
04:031:__ to 04:041:__	DA201 to DA211	0	DA2 Module (ADR1)	Free programmable

	Do not modify input fields

:03	Selection of output functions acc. to function no.	see Item 6.4

[5] Transducer

	Description	:03	:04			to:03	to:04	
05:001:__	Voltage transducer mains	400	400			V	V	
05:002:__	Voltage transducer generator	400	400			V	V	
05:003:__	CT ratio	500	5			A	A	
05:004:__	CT ratio differential	500	5			A	A	

__:___:03	Transducer primary	
__:___:04	Transducer secondary	

6] Configuration

	Description	:03	:04	to:03	to:04
06:003:__	Device identity	4	1		
06:004:__	Language	1	0	Tableau language – [1] A-B / [2] B-A	
06:005:__	Pulse factor	144	0	Pulse per turn	
06:006:__	Nominal voltage	400	0	in V	
06:007:__	Nominal current	500	0	in A	
06:008:__	Nominal power	345	0	in KW	
06:009:__	Nominal frequency	0	0	[0]=50Hz / [1]=60Hz	
06:010:__	Mains form	0	0	[0]=4-wire / [1]=3-wire	
06:011:__	-	0	0		
06:012:__	-	0	0		
06:013:__	-	0	0		
06:014:__	Mains control active	255	0	[255]=Yes / [0]=No	
06:015:__	Synchronizing active	255	0	[255]=Yes / [0]=No	
06:016:__	Diff protection active	0	0	[255]=Yes / [0]=No	
06:018:__	Device identity	0	0		
06:019:__	Mains view	255	0	[255]=Yes / [0]=No	
06:020:__	DE / EN	0	0		
06:021:__	PIN Mains protection testing	xxxx	0		
06:022:__	PIN Counter reset	xxxx	0		
06:023:__	PIN Edit	xxxx	0		
06:024:__	AI/AT Modules	0	0		see 06:024:04
06:025:__	DI/DO Modules	0	0		see 06:025:04
06:026:__	Profibus module 1	0	3	[255]=Yes / [0]=No	see 06:026:04
06:027:__	Profibus Modul 2	0	0		
06:028:__	Profinet Modul 1	0	0	[255]=Yes / [0]=No	
06:029:__	Profinet Modul 2	0	0		
06:030:__	Type of plant	2	0		
06:031:__	Home screen	94	0		
06:032:__	MPI address tableau	3	0	Address setting for tableau	
06:033:__	MPI address PLC	2	0	Address setting for PLC	
06:034:__	MPI default SAP	20	0		
06:035:__	MPI data block	19	0	Setting data block number	
06:036:__	M0:\SOP2\STD_DIR\	0	0		
06:037:__	M0:\SOP2\FAC_DIR\	0	0		
06:038:__	With protection device	255	0		
06:039:__	Time SYN with DI	0200	0	Time for SYN	[255]=Yes / [0]=No
06:040:__	Time SYN active	0	0		[255]=Yes / [0]=No
06:041:__	Time master	0	0		[255]=Yes / [0]=No
06:042:__	Time tableau block	0	0		[255]=Yes / [0]=No
06:043:__	Time SYN interval	10	0	SYN interval in minutes	

	Do not modify input fields

06:024:04	Activate AI1 and AT2 modules	AI1 – Module 1 = 1 AT1 – Module 1 = 8
06:025:04	Activate DI1 and DO1 modules	DI1 – Module 1 = always active DO1 – Module 1 = always active DO1 – Module 2 = 4
06:026:04	Address Profibus module	3 to 32

[7] Options

	Description	:03				to:03		
07:001:__	Operation solenoid	255				[255]=Yes / [0]=No		
07:002:__	Speed monitoring	255				[255]=Yes / [0]=No		
07:003:__	Special synchronizing function	255				[255]=Yes / [0]=No		
07:004:__	Ext CB control	0				[255]=Yes / [0]=No		
07:005:__	Power reduction F>	0				[255]=Yes / [0]=No		
07:006:__	Standby switching mains voltage	0				[255]=Yes / [0]=No		
07:007:__	Isochronous	255				[255]=Yes / [0]=No		
07:008:__	DI: First clothing / Pilot	0				[255]=Yes / [0]=No		
07:009:__	Cos phi controller	0				[255]=Yes / [0]=No		
07:010:__	Mains parallel possible	255				[255]=Yes / [0]=No		
07:011:__	Start speed max	0				[255]=Yes / [0]=No		
07:012:__	Only ext. load control	0				[255]=Yes / [0]=No		
07:013:__	Communication AS511	0				[255]=Yes / [0]=No		
07:014:__	Mains im-/export controller	0				[255]=Yes / [0]=No		
07:015:__	Monitoring mains quality	0				[255]=Yes / [0]=No		
07:016:__	Speed synchronization	255				[255]=Yes / [0]=No		

[8] Operating data

	Description	:03	:04	:05		to:03	to:04	
08:001:__	Ignition speed	400	40	0		rpm	rpm	
08:002:__	Nominal speed	1450	50	0		rpm	rpm	
08:003:__	Speed window open	1450	10	0		rpm	rpm	
08:004:__	Speed window closed	1550	10	0		rpm	rpm	
08:005:__	Gen. nominal voltage	80	3	0		%	%	
08:006:__	Gen. nominal frequency	480	20	0		1/10Hz	1/10Hz	
08:007:__	Mains nominal voltage	85	2	0		%	%	
08:008:__	Mains nominal frequency	480	20	0		1/10Hz	1/10Hz	
08:009:__	Min current AL076	10	1	0		%	%	
08:010:__	Min current AL077	10	1			%	%	

	Do not modify input fields

__:___:03	Limit value
__:___:04	Hysteresis

[9] Limit values

	Description	:03	:04	:05		to:03	to:04	
09:001:__	Supply UDC<	240	2	0		1/10V	1/10V	
09:002:__	Battery 1 U<	240	2	0				
09:003:__	Battery 2 U<	240	2	0				
09:004:__	Speed <	1300	2	0		rpm	rpm	
09:005:__	Speed >	1650	2	0		rpm	rpm	
09:006:__	Generator voltage >	115	2	0		%	%	
09:007:__	Generator voltage <	90	2	0		%	%	
09:008:__	Generator frequency >	540	2	0		1/10Hz	1/10Hz	
09:009:__	Generator frequency <	480	2	0		1/10Hz	1/10Hz	
09:010:__	Generator voltage >>	120	2	0		%	%	
09:011:__	Generator voltage <<	85	2	0		%	%	
09:012:__	Generator frequency >>	560	2	0		1/10Hz	1/10Hz	
09:013:__	Generator frequency <<	470	2	0		1/10Hz	1/10Hz	
09:014:__	Mains voltage >	103	2	0		%	%	
09:015:__	Mains voltage <	97	2	0		%	%	
09:016:__	Mains frequency >	502	1	0		1/10Hz	1/10Hz	
09:017:__	Mains frequency <	498	1	0		1/10Hz	1/10Hz	
09:018:__	Mains voltage >>	105	2	0		%	%	
09:019:__	Mains voltage <<	95	2	0		%	%	
09:020:__	Mains frequency >>	530	2	0		1/10Hz	1/10Hz	
09:021:__	Mains frequency <<	470	2	0		1/10Hz	1/10Hz	
09:022:__	Supply UDC >	290	1	0		1/10V	1/10V	
09:023:__	Battery 1 U >	270	1	0				
09:024:__	Battery 2 U >	270	1	0				
09:025:__	Mains rotating field	1	0	0		[1]=Right / [2]=Left		
09:026:__	Gen rotating field	1	0	0		[1]=Right / [2]=Left		
09:027:__	Mains voltage asymmetry	30	2	0		%	%	
09:028:__	Gen voltage asymmetry	30	2	0		%	%	
09:029:__	Mains angle fault	10	2	0		Degree	Degree	
09:030:__	Gen angle fault	10	2	0		Degree	Degree	
09:031:__	Cos Phi capacitive	800	50	0		1/1000	1/1000	
09:032:__	Cos Phi inductive	800	50	0		1/1000	1/1000	
09:033:__ to 09:036__	-	1	0	0				
09:037:__ to 09:042:__	Analog input 5 to Analog input 10	50	2	0	Limit values for the alarms 251 to 256			
09:043:__ to 09:054:__	-	50	2	0				
09:055:__ to 09:066:__	Analog input 5 to Analog input 10	50	2	0	Limit values for the relay outputs			
09:067:__ to 09:090:__	-	50	2	0				
09:091:__ to 09:106:__	Analog input PT1 to PT6 Analog input 23 to 24	50	2	0	Limit values for the alarms 273 to 288			
09:107:__ to 09:122:__	-	50	2	0				
09:123:__ to 09:138:__	Analoge input PT1 to PT6 Analog input 23 to 24	50	2	0	Limit values for the relay outputs			
09:139:__ to 09:154:__	-	50	2	0				

	Do not modify input fields

__:___:03	Limit value	When entering the numerical values the selected unit has to be input with decimals
__:___:04	Hysteresis	

[10] Alarms

	Description	:01	:02	:03	:04			
10:001:__ to 10:016:__	-	-	-	-	10	-		
10:017:__ to 10:038:__	-	-	-	-	0	-		
10:039:__	AL167 Supply UDC<	AL169	AL169	xxxxx…	300	Internal alarm		
10:040:__ to 10:043:__	-	-	-	-	0	-		
10:044:__	AL172 Syn time too long	AL172	AL172	xxxxx…	1800	Internal alarm		
10:045:__	AL173 Watchdog	AL173	AL173	xxxxx…	20	Internal alarm		
10:046:__	AL174 Supply UDC>	AL174	AL174	xxxxx…	2	Internal alarm		
10:047:__	-	-	-	-	-			
10:048:__	-	-	-	-	-			
10:049:__	AL177 Mains voltage <<	AL177	AL177	xxxxx…	2	Internal alarm		
10:050:__	AL178 Mains voltage <	AL178	AL178	xxxxx…	20	Internal alarm		
10:051:__	AL179 Mains voltage >	AL179	AL179	xxxxx…	20	Internal alarm		
10:052:__	AL180 Mains voltage >>	AL180	AL180	xxxxx…	2	Internal alarm		
10:053:__	AL181 Mains frequency <<	AL181	AL181	xxxxx…	2	Internal alarm		
10:054:__	AL182 Mains frequency <	AL182	AL182	xxxxx…	20	Internal alarm		
10:055:__	AL183 Mains frequency >	AL183	AL183	xxxxx…	20	Internal alarm		
10:056:__	AL184 Mains frequency >>	AL184	AL184	xxxxx…	2	Internal alarm		
10:057:__	AL185 Mains rotating field	AL185	AL185	xxxxx…	10	Internal alarm		
10:058:__	AL186 Mains angle fault	AL186	AL186	xxxxx…	10	Internal alarm		
10:059:__	AL187 Mains voltage asymmetry	AL187	AL187	xxxxx…	10	Internal alarm		
10:060:__	-	AL188	AL188	-	2	Internal alarm		
10:061:__	AL189 BDEW - U(t) time runs	AL189	AL189	xxxxx…	2	Internal alarm		
10:062:__	AL190 BDEW - U(t) fault	AL190	AL190	xxxxx…	2	Internal alarm		
10:063:__	-	AL191	AL191	xxxxx…	2	Internal alarm		
10:064:__	-	AL192	AL192	xxxxx…	2	Internal alarm		
10:065:__	AL193 Generator voltage <<	AL193	AL193	xxxxx…	10	Internal alarm		
10:066:__	AL194 Generator voltage <	AL194	AL194	xxxxx…	10	Internal alarm		
10:067:__	AL195 Generator voltage >	AL195	AL195	xxxxx…	10	Internal alarm		
10:068:__	AL196 Generator voltage >>	AL196	AL196	xxxxx…	10	Internal alarm		
10:069:__	AL197 Generator frequency <<	AL197	AL197	xxxxx…	10	Internal alarm		
10:070:__	AL198 Generator frequency <	AL198	AL198	xxxxx…	10	Internal alarm		
10:071:__	AL199 Generator frequency >	AL199	AL199	xxxxx…	10	Internal alarm		
10:072:__	AL200 Generator frequency >>	AL200	AL200	xxxxx…	10	Internal alarm		
10:073:__	AL201 Generator rotating field	AL201	AL201	xxxxx…	10	Internal alarm		
10:074:__	AL202 Generator angle fault	AL202	AL202	xxxxx…	10	Internal alarm		
10:075:__	AL203 Generator voltage asymmetry	AL203	AL203	xxxxx…	10	Internal alarm		
10:076:__	AL204 Cos Phi capacitive	AL204	AL204	xxxxx…	10	Internal alarm		
10:077:__	AL205 Cos Phi inductive	AL205	AL205	xxxxx…	10	Internal alarm		
10:078:__	-	AL206	AL206	-	2	Internal alarm		
10:079:__	-	AL207	AL207	-	2	Internal alarm		
10:080:__	-	AL208	AL208	-	2	Internal alarm		
10:081:__	AL209 Mains protection collective fault	AL209	AL209	xxxxx…	0	Internal alarm		
10:082:__	AL210 Mains protection U<<	AL210	AL210	xxxxx…	0	Internal alarm		
10:083:__	AL211 Mains protection U<	AL211	AL211	xxxxx…	0	Internal alarm		
10:084:__	AL212 Mains protection U>	AL212	AL212	xxxxx…	0	Internal alarm		
10:085:__	AL213 Mains protection U>>	AL213	AL213	xxxxx…	0	Internal alarm		
10:086:__	AL214 Mains protection F<<	AL214	AL214	xxxxx…	0	Internal alarm		
10:087:__	AL215 Mains protection F<	AL215	AL215	xxxxx…	0	Internal alarm		
10:088:__	AL216 Mains protection F>	AL216	AL216	xxxxx…	0	Internal alarm		
10:089:__	AL217 Mains protection F>>	AL217	AL217	xxxxx…	0	Internal alarm		
10:090:__	AL218 Mains protection vector surge >	AL218	AL218	xxxxx…	0	Internal alarm		
10:091:__	AL219 Mains protection vector surge>>	AL219	AL219	xxxxx…	0	Internal alarm		
10:092:__	AL220 Dif. vector surge >	AL220	AL220	xxxxx…	0	Internal alarm		
10:093:__	AL221 Dif. vector surge >>	AL221	AL221	xxxxx…	0	Internal alarm		
10:094:__	AL222 Q-U protection >	AL222	AL222	xxxxx…	0	Internal alarm		
10:095:__	AL223 Q-U protection >>	AL223	AL223	xxxxx…	0	Internal alarm		
10:096:__	-	AL224	AL224	-	0	Internal alarm		
10:097:__	AL225 Overcurrent >	AL225	AL225	xxxxx…	10	Internal alarm		
10:098:__	AL226 Overcurrent >>	AL226	AL226	xxxxx…	10	Internal alarm		
10:099:__	AL227 Overcurrent VDE0100-718	AL227	AL227	xxxxx…	10	Internal alarm		

	Description	:01	:02	:03	:04			
10:100:__	AL228 Inv. time overcurrent prot.	AL228	AL228	xxxxx…	10	Internal alarm		
10:101:__	-	AL229	AL229	-	10	Internal alarm		
10:102:__	-	AL230	AL230	-	10	Internal alarm		
10:103:__	AL231 VDE4105 Power reduction	AL231	AL231	xxxxx…	3000	Internal alarm		
10:104:__	AL232 Power >	AL232	AL232	xxxxx…	100	Internal alarm		
10:105:__	AL233 Power >>	AL233	AL233	xxxxx…	2	Internal alarm		
10:106:__	AL234 Reverse power >	AL234	AL234	xxxxx…	100	Internal alarm		
10:107:__	L235 Reverse power >>	AL235	AL235	xxxxx…	2	Internal alarm		
10:108:__	AL236 Apparent power >	AL236	AL236	xxxxx…	100	Internal alarm		
10:109:__	AL237 Apparent power >>	AL237	AL237	xxxxx…	2	Internal alarm		
10:110:__	AL238 Reactive power >	AL238	AL238	xxxxx…	100	Internal alarm		
10:111:__	AL239 Reactive power >>	AL239	AL239	xxxxx…	2	Internal alarm		
10:112:__	AL240 Unbalanced load	AL240	AL240	xxxxx…	100	Internal alarm		
10:113:__	AL241Diff current >	AL241	AL241	xxxxx…	2	Internal alarm		
10:114:__	AL242 Diff current >>	AL242	AL242	xxxxx…	2	Internal alarm		
10:115:__	AL243 VDE4105 – Coll. Fault	AL243	AL243	xxxxx…	0	Internal alarm		
10:116:__	AL244 VDE4105 – U< (80%)	AL244	AL244	xxxxx…	0	Internal alarm		
10:117:__	AL245 VDE4105 – U>> (115%)	AL245	AL245	xxxxx…	0	Internal alarm		
10:118:__	AL246 VDE4105 – F< (47,5Hz)	AL246	AL246	xxxxx…	0	Internal alarm		
10:119:__	AL247 VDE4105 – F> (51,5Hz)	AL247	AL247	xxxxx…	0	Internal alarm		
10:120:__	AL248 VDE4105 – U> (Quality)	AL248	AL248	xxxxx…	0	Internal alarm		
10:121:__	AL249 Underspeed	AL249	AL249	xxxxx…	2	Internal alarm		
10:122:__	AL250 Overspeed	AL250	AL250	xxxxx…	2	Internal alarm		
10:123:__	AL251 Analog input 5	AL251	AL251	xxxxx…	0	Internal alarm		
10:124:__	AL252 Analog input 6	AL252	AL252	xxxxx…	0	Internal alarm		
10:125:__	AL253 Analog input 7	AL253	AL253	xxxxx…	0	Internal alarm		
10:126:__	AL254 Analog input 8	AL254	AL254	xxxxx…	0	Internal alarm		
10:127:__	AL255 Analog input 9	AL255	AL255	xxxxx…	0	Internal alarm		
10:128:__	AL256 Analog input 10	AL256	AL256	xxxxx…	0	Internal alarm		
10:129:__ to 10:144:__	-	-	-	-	0	-		
10:145:__	AL273 PT1>	AL273	AL273	xxxxx…	10	External Alarm		
10:146:__	AL274 PT1>>	AL274	AL274	xxxxx…	10	External Alarm		
10:147:__	AL275 PT2>	AL275	AL275	xxxxx…	10	External Alarm		
10:148:__	AL276 PT2>>	AL276	AL276	xxxxx…	10	External Alarm		
10:149:__	AL277 PT3>	AL277	AL277	xxxxx…	10	External Alarm		
10:150:__	AL278 PT3>>	AL278	AL278	xxxxx…	10	External Alarm		
10:151:__	AL279 PT4>	AL279	AL279	xxxxx…	10	External Alarm		
10:152:__	AL280 PT4>>	AL280	AL280	xxxxx…	10	External Alarm		
10:153:__	AL281 PT5>	AL281	AL281	xxxxx…	10	External Alarm		
10:154:__	AL282 PT5>>	AL282	AL282	xxxxx…	10	External Alarm		
10:155:__	AL283 PT6>	AL283	AL283	xxxxx…	10	External Alarm		
10:156:__	AL284 PT6>>	AL284	AL284	xxxxx…	10	External Alarm		
10:157:__	AL285 AI23>	AL285	AL285	xxxxx…	10	External Alarm		
10:158:__	AL286 AI23>>	AL286	AL286	xxxxx…	10	External Alarm		
10:159:__	AL287 AI24>	AL287	AL287	xxxxx…	10	External Alarm		
10:160:__	AL288 AI24>>	AL288	AL288	xxxxx…	10	External Alarm		
10:161:__ to 10:176:__	-	-	-	-	10	-		

	Do not modify input fields

__:___:01	Text for language 1	
__:___:02	Text for language 2	
__:___:03	Numbers acc. to alarm coding	[0]=Disabled / [1]=Enabled
__:___:04	Delay in 1/10 secs.	

[11] Counter

	Description	:03						
11:001:__	-	0						

[12] Times

	Description	:03				to:03		
12:001:__ to 12:043:__	-	0						

[13] Diff protection

	Description	:03	:04	:05		to:03	to:04	to:05
13:001:__	Diff current >	10	2	0		%	%	
13:002:__	Diff current >>	20	2	0		%	%	
13:003:__	Trip point of trip charact.	50	2	0		%		
13:004:__	Trip blocking	25	2	50		%		1/10 Sec

	Do not modify input fields

__:___:03	Limit value in %	
__:___:04	Hysteresis in %	
__:___:05	Times in 1/10 secs.	

[14] Current protection

	Description	:03	:04	:05		to:03	to:04	to:05
14:001:__	Overcurrent VDE 100-718	110	2	0				
14:002:__	Overcurrent >	300	2	0		%	%	
14:003:__	Overcurrent >>	350	2	0		%	%	
14:004:__	Overcurrent time protection	3	0	1000		Fct.-No.		1/100

	Do not modify input fields

__:___:03	Limit value	
__:___:04	Hysteresis	
__:___:05	Time multiplicator	

14:004:03	Select characteristic	[1] IEC-inverse [2] IEC-very inverse [3] IEC-extremely inverse [4] IEC-long inverse [5] ANSI-inverse [6] ANSI-short inverse [7] ANSI-long inverse [8] ANSI-moderately inverse [9] ANSI- very inverse [10] ANSI- extremely inverse [11] ANSI-definite inverse

[15] Mains protection

	Description	:03	:04	:05		to:03	to:04	to:05
15:001:__	Mains protection U<<	80	2	4		%	%	1/100 Sec
15:002:__	Mains protection U <	80	2	4		%	%	1/100 Sec
15:003:__	Mains protection U >	110	2	4		%	%	1/100 Sec
15:004:__	Mains protection U >>	115	2	4		%	%	1/100 Sec
15:005:__	Mains protection F<<	475	2	4		1/10 Hz	1/10 Hz	1/100 Sec
15:006:__	Mains protection F<	492	2	4		1/10 Hz	1/10 Hz	1/100 Sec
15:007:__	Mains protection F>	508	2	4		1/10 Hz	1/10 Hz	1/100 Sec
15:008:__	Mains protection F>>	515	2	4		1/10 Hz	1/10 Hz	1/100 Sec
15:009:__	Mains prot vector >	6	2	0		degree		
15:010:__	Mains prot vector >>	12	2	0		degree		
15:011:__	Reset time	3	0	0				
15:012:__	Q-U protection U<	85	2	50		%		1/100 Sec
15:013:__	Q-U protection Q<	6	0	0		degree		
15:014:__	Q-U protection U<<	85	2	50		%		1/100 Sec
15:015:__	Q-U protection Q<<	3	0	0		degree		

	Do not modify input fields

__:___:03	Limit value	Voltage in % Frequency in 1/10 Hz Phi in degrees
__:___:04	Hysteresis	Voltage in % Frequency in 1/10 Hz Phi in degrees
__:___:05	Times in 1/100 Seconds	

[16] Power protection

	Description	:03	:04	:05		to:03	to:04	
16:001:__	Active power loaded	10	0	0		%	%	
16:002:__	Active power >	115	2	0		%	%	
16:003:__	Active power >>	120	2	0		%	%	
16:004:__	Reverse power >>	-5	2	0		%	%	
16:005:__	Reverse power >>	-10	2	0		%	%	
16:006:__	Unbalanced load	30	2	0		%	%	
16:007:__	KWH Pulse	10	2	0		KW		
16:008:__	Apparent power >	115	2	0		%	%	
16:009:__	Apparent power >>	120	2	0		%	%	
16:010:__	Reactive power >	15	2	0		%	%	
16:011:__	Reactive power >>	20	2	0		%	%	

	Do not modify input fields

__:___:03	Limit value
__:___:04	Hysteresis

[17] Synchronization

	Description	:03				to:03		
17:001:__	Advance time	50				msec		
17:002:__	Max. frequency diff.	10				1/100 Hz		
17:003:__	Min. frequency diff.	5				1/100 Hz		
17:004:__	Max. voltage diff.	5				%		
17:005:__	Syn pulse length	200				msec		
17:006:__	-	0						
17:007:__	-	0						
17:008:__	-	0						
17:009:__	-	0						
17:010:__	Frequency integration time	50				Periods		
17:011:__	Setpoint frequency	500				1/10 Hz		
17:012:__	Setpoint voltage	100				%		

	Do not modify input fields

__:___:03	Adjustment	

[18] Controller

	Description	:04	:05	:06	:07	:08	:10	
18:001:__	PID U island	1000	200	0	2	10	0	
18:002:__	PID U syn	1000	200	0	2	0	0	
18:003:__	PID cos phi mains parallel	1000	200	0	2	10	0	
18:004:__	PID cos phi gen parallel	1000	200	0	2	10	0	
18:005:__	-	1000	200	0	2	5	0	
18:006:__	PID F island	1000	200	0	2	5	0	
18:007:__	PID F syn	1000	200	0	2	0	0	
18:008:__	PID power mains parallel	1000	200	0	2	10	0	
18:009:__	PID power gen parallel	1000	200	0	2	10	0	

	Do not modify input fields

__:___:03	-	
__:___:04	P-part	Kp in 1/100
__:___:05	I-part	Ti in 1/100 Secs
__:___:06	D-part	Td in 1/100 Secs
__:___:07	T1-factor	T1 in 1/10 Secs
__:___:08	Neutral zone	Frequency in 1/100 Hz All other values in 1/10 %
__:___:09	-	
__:___:10	Delayed release	In 1/10 Secs

[19] Pulse controller

	Description	:03	:04	:05		to:03	to:04	to:05
19:001:__	Voltage island	100	2	3			1/10 Sec	%
19:002:__	Frequency island	100	2	5			1/10 Sec	1/100 Hz
19:003:__	Voltage syn	100	2	3			1/10 Sec	%
19:004:__	Frequency syn	100	2	0			1/10 Sec	1/100 Hz
19:005:__	Cos phi parallel	50	2	3			1/10 Sec	%
19:006:__	Power parallel	50	2	3			1/10 Sec	%

__:___:03	Boosting	
__:___:04	Pulse length	
__:___:05	Death zone	

[20] Motorpoti

	Description	:03	:04	:05				
20:001:__	El. Poti F/P	600	40	3				
20:002:__	El. Poti U/PF	600	20	3				

	Do not modify input fields

[21] Int. Setpoints)

	Description	:03	:04			to:03	to:04	
21:001:__	Power	1000	0			1/10 %	1/10 %	
21:002:__	-	500	-500			KW	KW	
21:002:__	Cos Phi	50	-50			1/100 LF	1/100 LF	

__:___:03	Max value
__:___:04	Min value

[22] VDE table

	Description	:03	:04	:05		to:03	to:04	to:05
22:001:__	Standby switching U>	85	1	600		%		1/10 Sec.
22:002:__	Standby switching U<	110	1	600		%		1/10 Sec.
22:003:__	Standby switching F>	4750	1	600		1/100 Hz		1/10 Sec.
22:004:__	Standby switching F<	5005	1	600		1/100 Hz		1/10 Sec.
22:005:__	VDE NA-protection U<	80	1	0		%		
22:006:__	VDE NA-protection U>	115	1	0		%		
22:007:__	VDE NA-protection F<	475	1	0		1/10 Hz		
22:008:__	VDE NA-protection F>	515	1	0		1/10 Hz		
22:009:__	VDE NA-protection U>(Quality)	110	1	0		%		
22:010:__	Ext. power red. level 1	60	0	0		%		
22:011:__	Ext. power red. level 2	30	0	0		%		
22:012:__	Ext. power red. level 3	10	0	0		%		
22:013:__	VDE Power red. F>	5020	5150	0		1/100 Hz	1/100 Hz	
22:014:__	VDE Power red. - % / Hz	40	10	0				
22:015:__	Cos Phi in response of power - 1	950	10	0		1/1000	%	
22:016:__	Cos Phi in response of power - 2	-950	90	0		1/1000	%	
22:017:__	Dyn. Mains support - U(t) 1	0	0	15		%		1/100 Sec
22:018:__	Dyn. Mains support - U(t) 2	300	0	15		%		1/100 Sec
22:019:__	Dyn. Mains support - U(t) 3	700	0	15		%		1/100 Sec
22:020:__	Dyn. Mains support - U(t) 4	700	0	70		%		1/100 Sec
22:021:__	Dyn. Mains support - U(t) 5	900	0	150		%		1/100 Sec
22:022:__	Dyn. Mains support - U(t) 6	900	0	300		%		1/100 Sec

	Do not modify input fields

__:___:03	Limit value 1
__:___:04	Limit value 2
__:___:04	Times

[23] Reserve

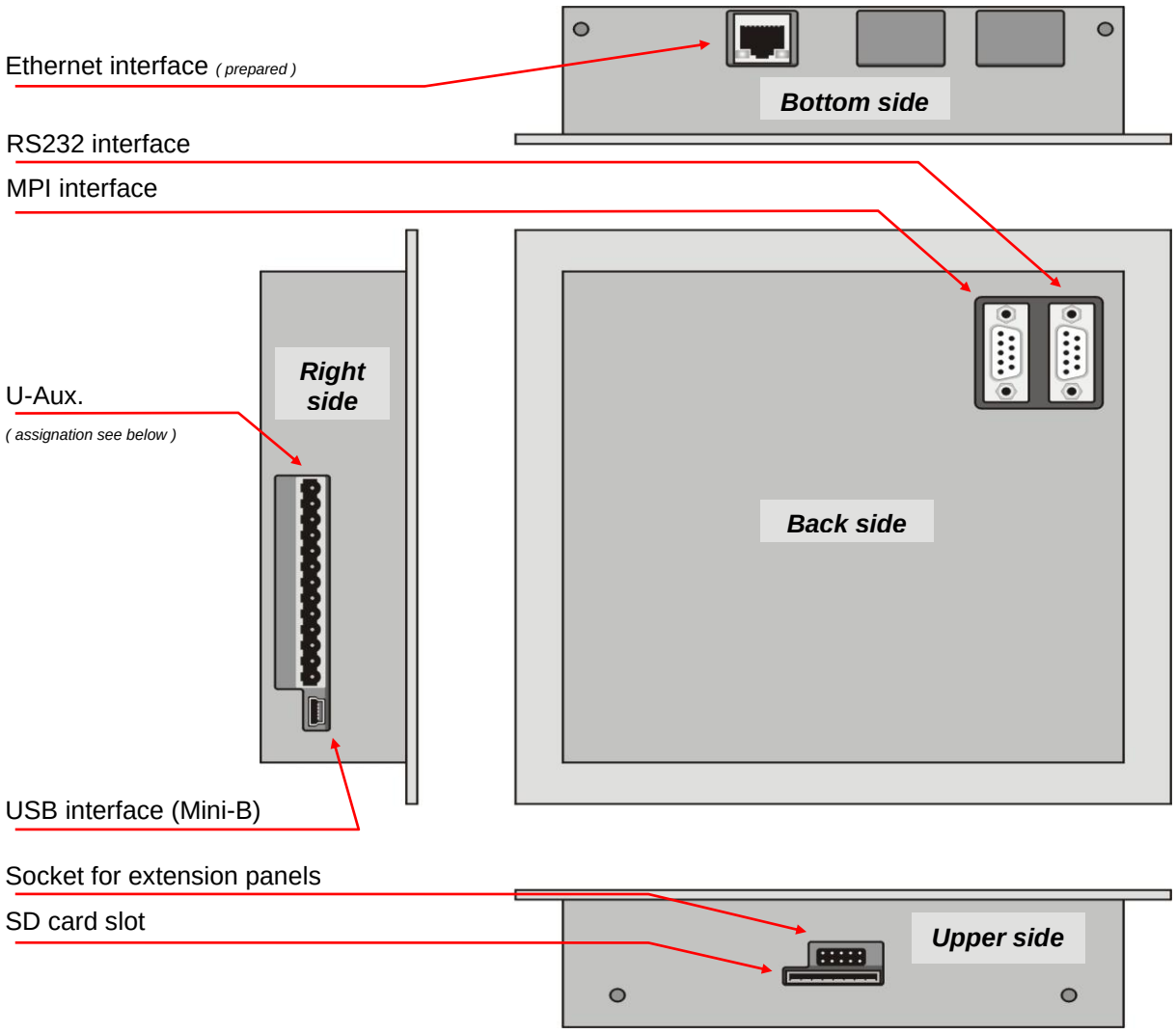
	Description	:03						
23:001:__	Without function	0						

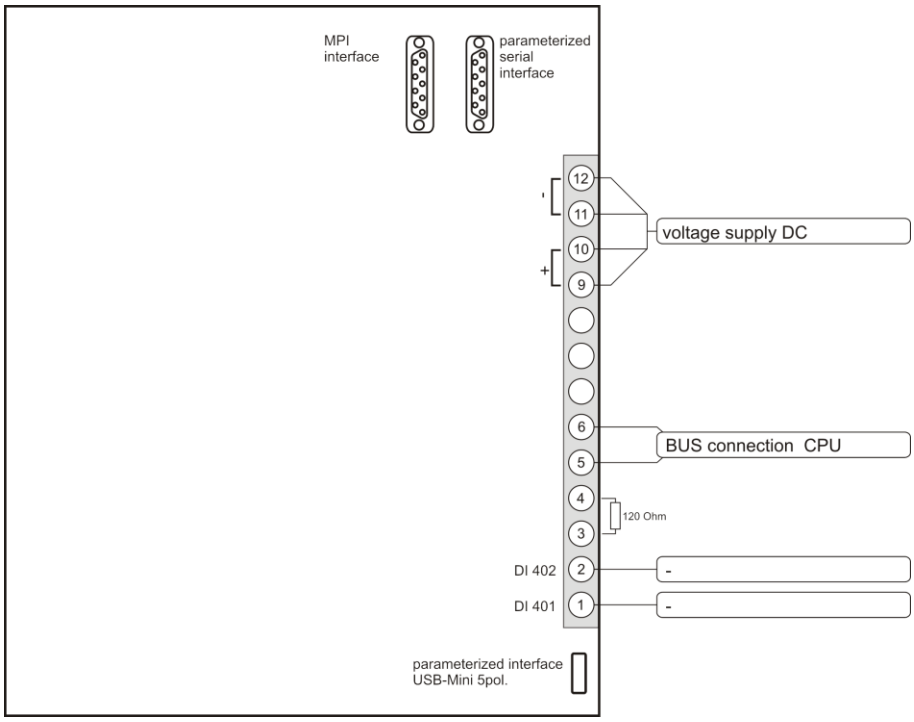
[24] LED

	Description	:03						
24:001:__ to 24:005:__	Without function	0						

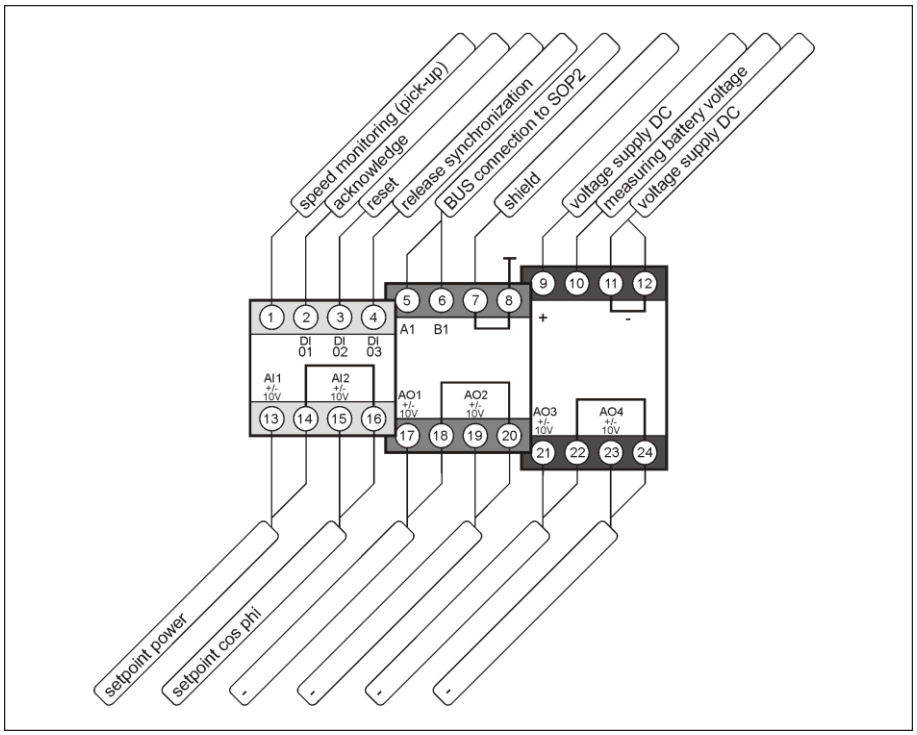
9 Connecting diagrams

9.1 Display and operating device SOP2

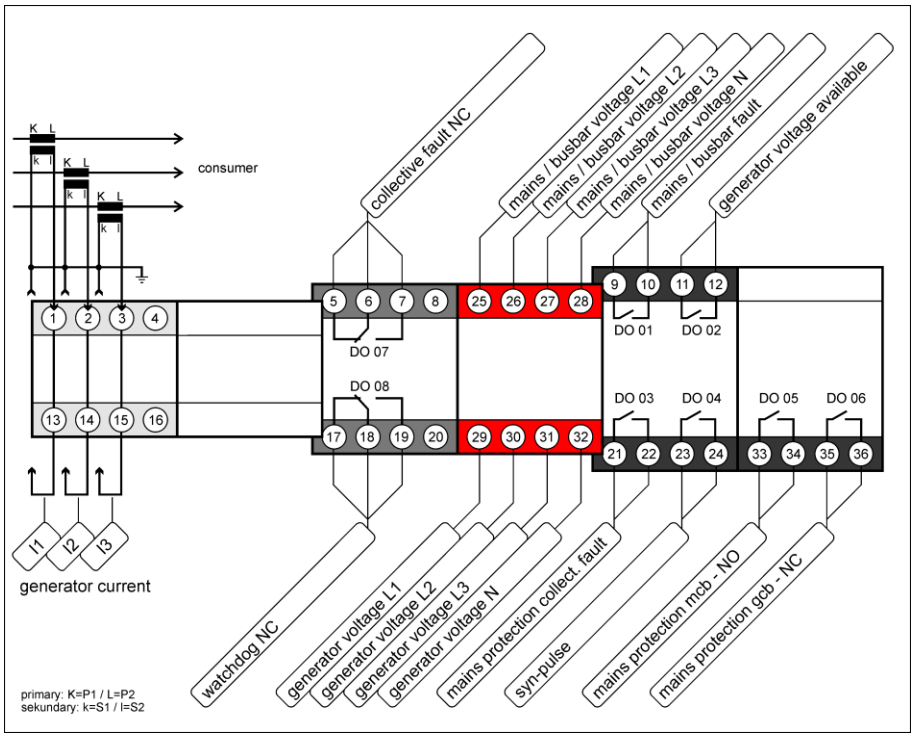




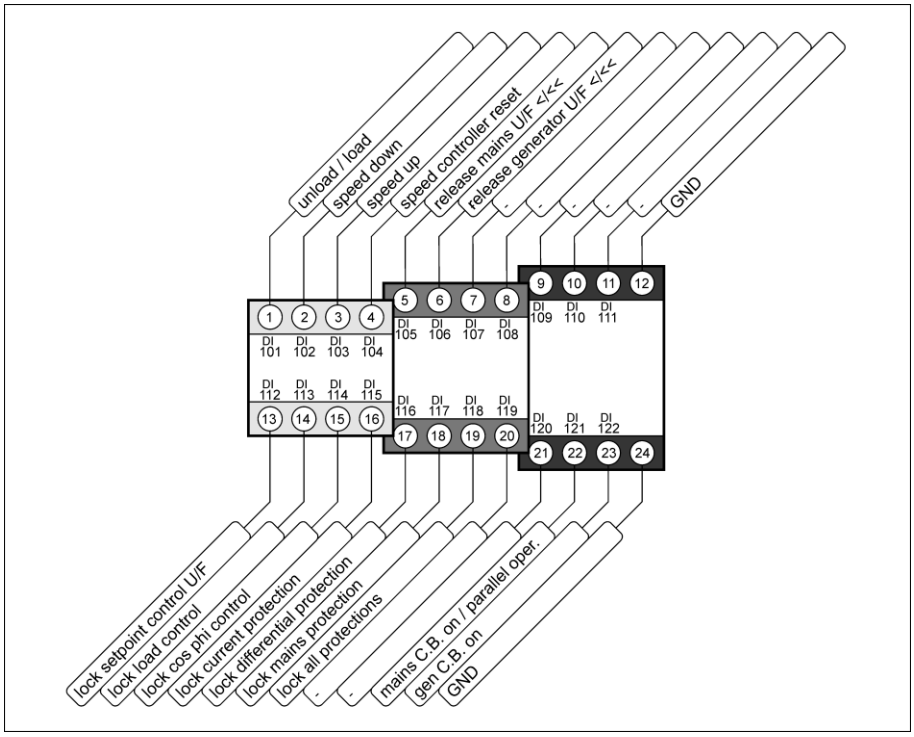
9.2 CPU Module



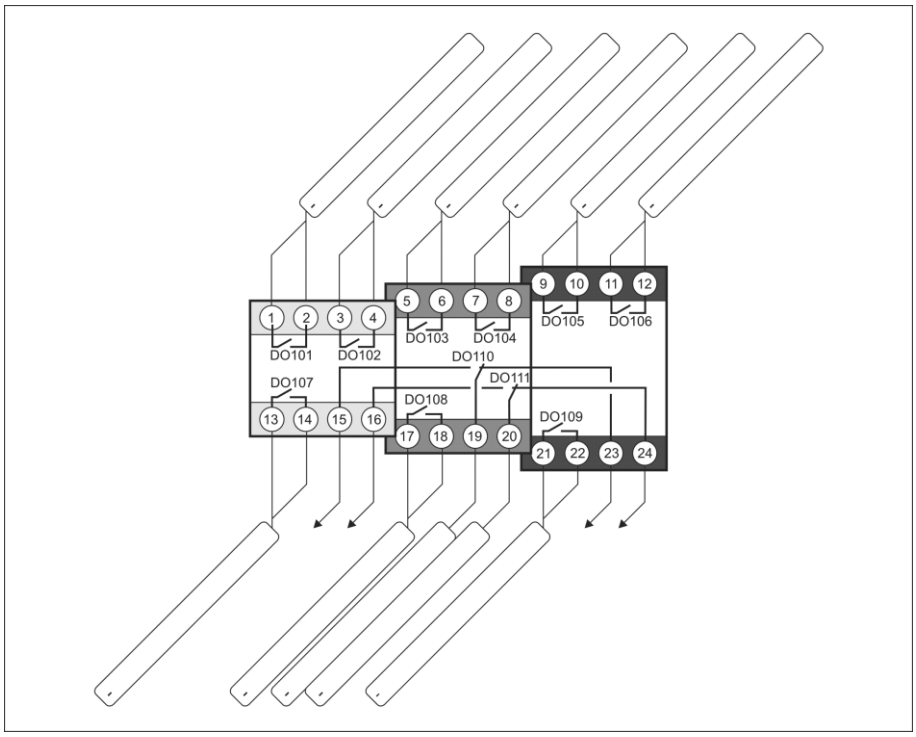
9.3 Power module PM1



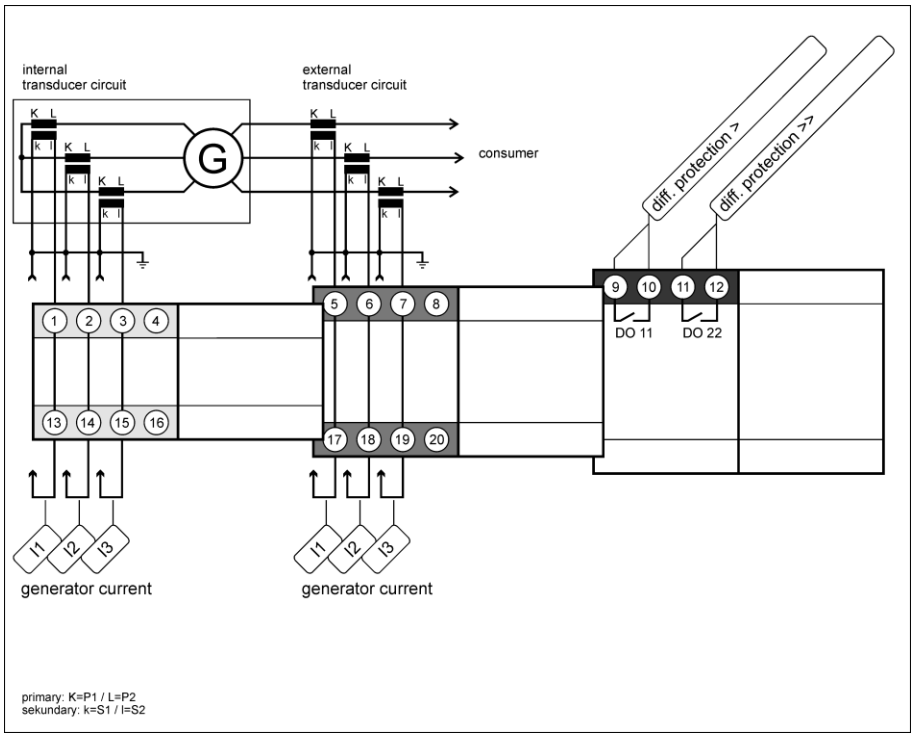
9.4 Input module DI1



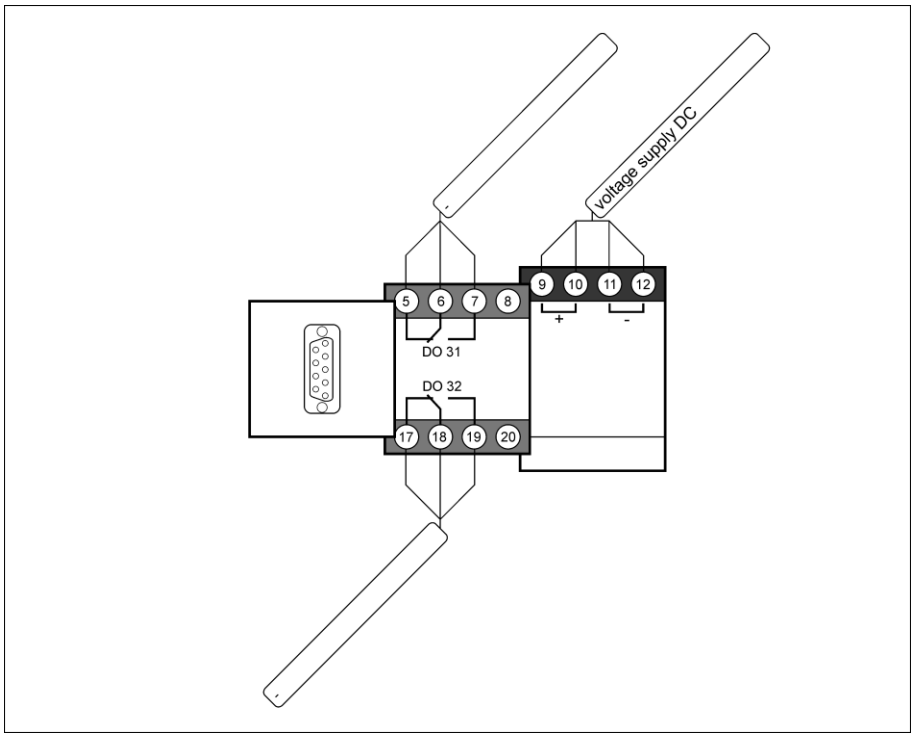
9.5 Output module DO1



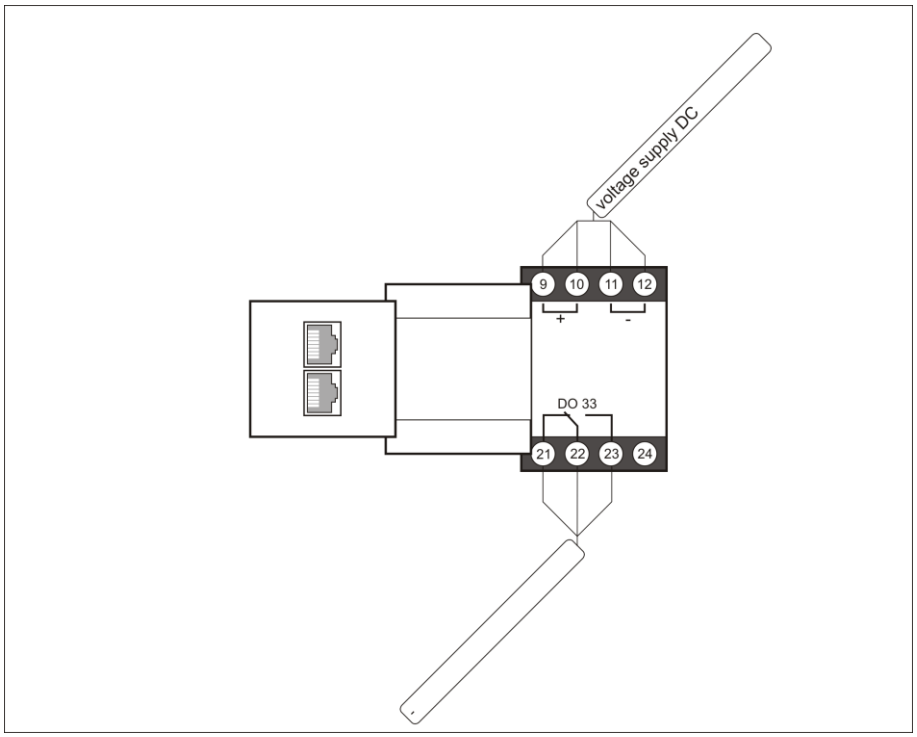
9.6 Diff. Prot. module



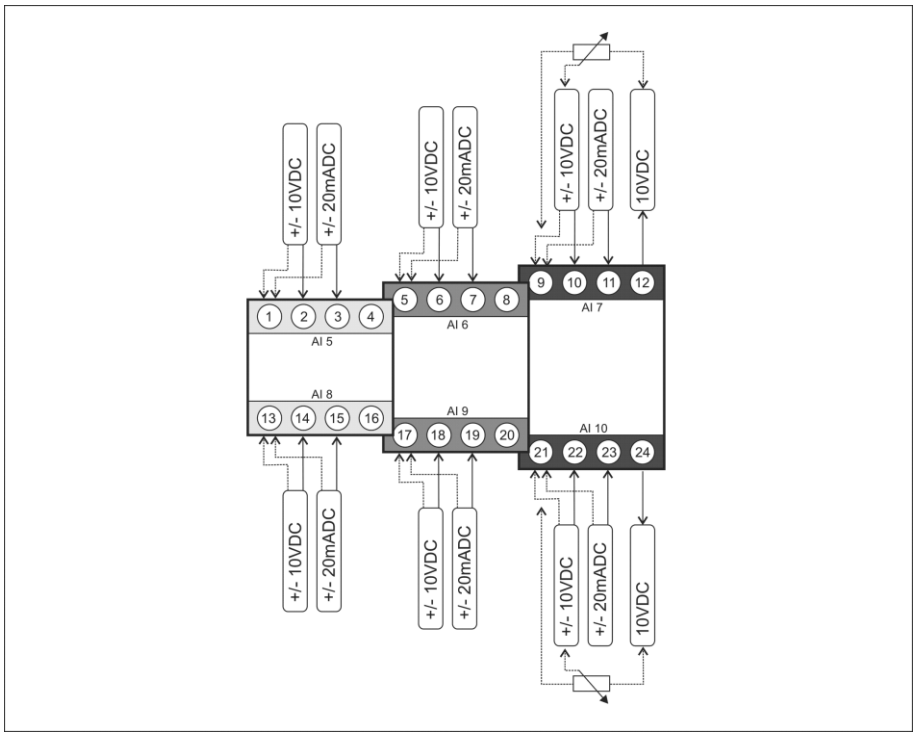
9.7 Profibus module PB1



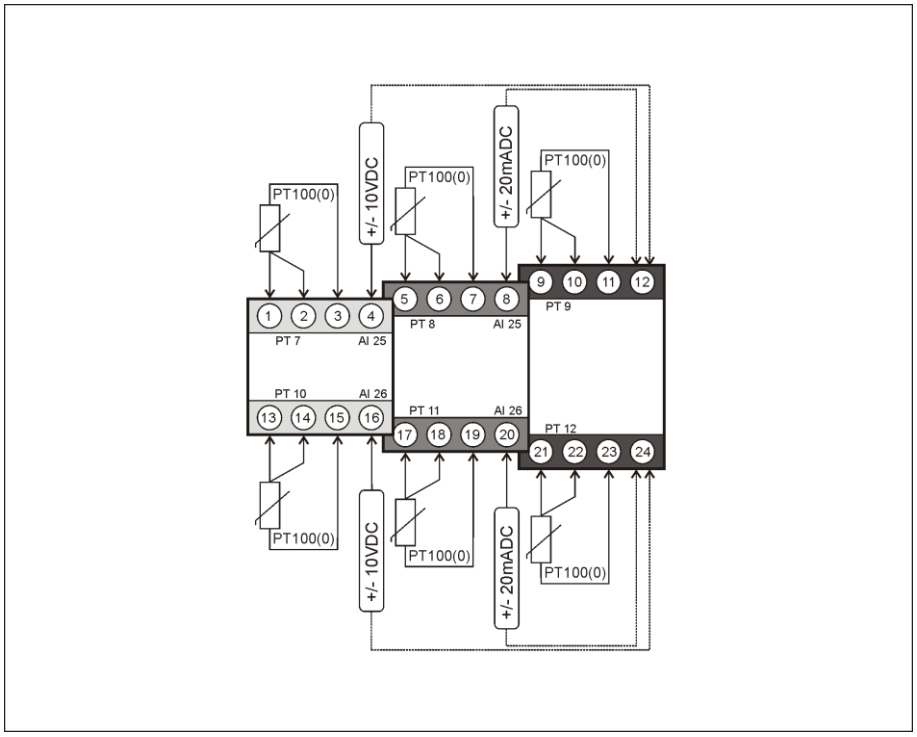
9.8 Profinetmodul PN1



9.9 Analog input module AI1



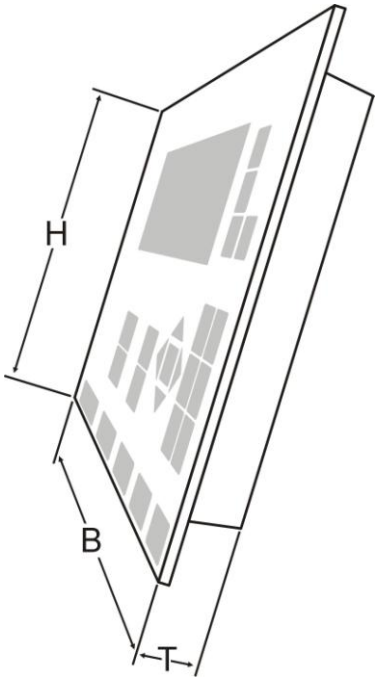
9.10 PT100(0) Modul



10 Casing variants and dimensions

10.1 SOP2

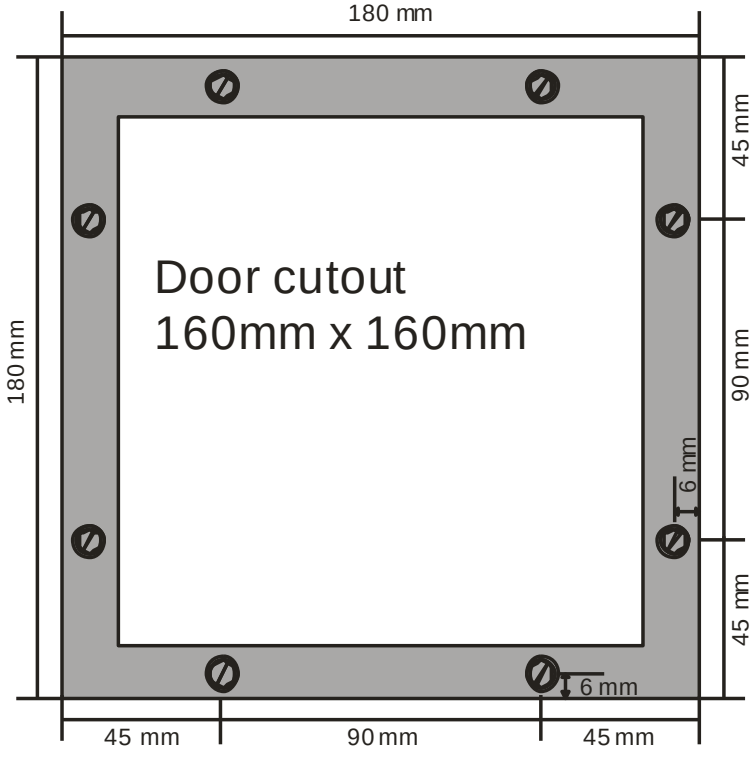
Variant	Metal casing
Weight	1.800 g
Mounting	Stay bolts M4 x 12mm
Protection category	IP 42, with sealing IP 64



Dimensions

Width(W)	180 mm
Height (H)	180 mm
Depth (D)	43 mm
Mounting depth	approx. 40 mm (*without plug*)

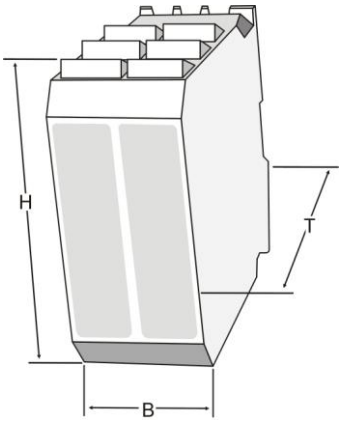
10.1.1 Dimensions for door fitting



Rear view

10.2 Modules

Variant	DIN plastic casing (*Polyamide*)
Mounting	on DIN rail
Protection category	IP 40, terminal IP 20

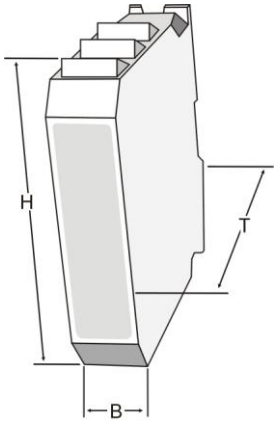


Module dimensions PM1 und DM1

Width (W)	45,0 mm
Height (H)	99,0 mm
Depth (D)	114,5 mm

Dimensions CPU, DI1, DO1, PB1, PN1, AI1 and AT1

Width (W)	22,5 mm
Height (H)	99,0 mm
Depth (D)	114,5 mm



11 Technical Data

Installation and commissioning should only be carried out by skilled and trained professionals. Connection acc. to VDE 0160!

Auxiliary voltage	24 V (18 ... 34 V) DC
Power consumption	SOP2 max. 3VA ; CPU max. 8VA ; PB1 max. 3VA ; PN1 max. 3VA
Digital inputs	24 V 8 mA (optically decoupled), input resistance > 3 kΩ, cable length should not exceed 2,5 m input OFF < 7V, input ON > 8V
Measuring voltage	40/70 … 280/484 VAC power consumption: max. 0,35VA/phase impulse-resistant up to 3 kV
Measuring current	nominal current: -/5 A (0,15 ... 18 A) AC; -/1 A (0,03 … 3,5 A)AC power consumption: max. 0,50VA/Phase 4 x $I_{nom.}$ continuous current 10 x $I_{nom.}$ 10 sec. 50 x $I_{nom.}$ 0,001 sec. apparent ohmic resistance <0,01 Ohm
Recommended transducer type	max. 4 * I_{Nom}
Analogue outputs	+/-10 V (U_{max} 11 V) DC, 12 bit resolution minimum step width 5 mV / digit reproducibility +/- 5 mV, apparent ohmic resistance > 1 kΩ galvanic isolation max. 500V
Relay outputs	NO/CO 250 VAC, 2 A galvanically isolated
Nominal frequency	50 / 60 Hz (adjustable)
Frequency measurement	30 ... 70 Hz, +/- 0,05 Hz
Measurement accuracy (with nominal frequency 100 % sinus)	voltage measurement <= 0,5 % currency measurement <= 0,5 % power measurement <= 1 % CosPhi <= 1° frequency measurement <= 0,05 Hz
Protection category	casing: IP 40, terminal IP 20
Ambient air temperature	-20 ... +55 °C
Height above sea level	max. 1000 m
Humidity	max. 90 % without condensation
Software	Parameter software device management 2 (GV_2.exe)
System requirements:	IBM compatible PC, min. 1,2 GHz, 512 MB RAM Operating system MS Windows: XP (SP3), Vista (SP1) or Windows 7

11.1 Protection functions with ANSI-Code

ANSI 12	Overspeed	AL122 Overspeed
ANSI 14	Underspeed	AL121 Underspeed
ANSI 27	Undervoltage relay	AL065 Generator voltage << AL066 Generator voltage < AL082 Mains protection U<< AL083 Mains protection U<
ANSI 32	Directional power relay Reverse power relay	AL104 Power >>>br>AL105 Power >>>br>AL106 Reverse power >>br>AL107 Reverse power >>
ANSI 40	Underexcitation protection	AL110 Reactive power >>br>AL111 Reactive power >>
ANSI 46	Phase balance current relay	AL112 Unbalanced load
ANSI 47	Phase sequence voltage relay	AL073 Generator rotating field
ANSI 50	Instantaneous overcurrent relay	AL097 Overcurrent >>br>AL098 Overcurrent >>
ANSI 51	AC Time overcurrent relay	AL100 Overcurrent time protection
ANSI 55	Power factor relay	AL076 Cos Phi capacitive AL077 Cos Phi inductive
ANSI 59	Overvoltagerelay	AL068 Generator voltage >>br>AL069 Generator voltage >>br>AL084 Mains protection U>>br>AL085 Mains protection U>>
ANSI 78	Phase angel measuring „Out-of-Step“ relay	AL074 Generator angle fault AL090 Mains protection vector >>br>AL091 Mains protection vector >>
ANSI 81	Frequency relay	AL069 Generator frequency << AL070 Generator frequency < AL071 Generator frequency >>br>AL071 Generator frequency >> AL086 Mains protection F<< AL087 Mains protection F< AL088 Mains protection F>>br>AL089 Mains protection F>>
ANSI 87	Differential protective relay	AL113 Diff current >>br>AL114 Diff current >>

12 Data transfer

It is possible to upgrade the KSS with a Profibus DP Module PB1 or with a Profinet Module PN1 for the connection with a PLC. The corresponding module must be configured via the respective GSD file within a PLC project. A random combination of the values to be transmitted is possible. A maximum of 60 modules out of a selection of 209 modules is available. The maximum data length is 244 bytes. It is only supported the Profibus Master DPV0.

Profibus Master DPV1 is <u>not</u> supported.

The use of the universal module of the GSD file is not supported.

The **participant address** can be configured. (*See Chap. 4.3.6.2)*

12.1 Device master file

The name of the device master file for the KAS Profibus connection via the PB1 has the file name: HPS0097.gsd.

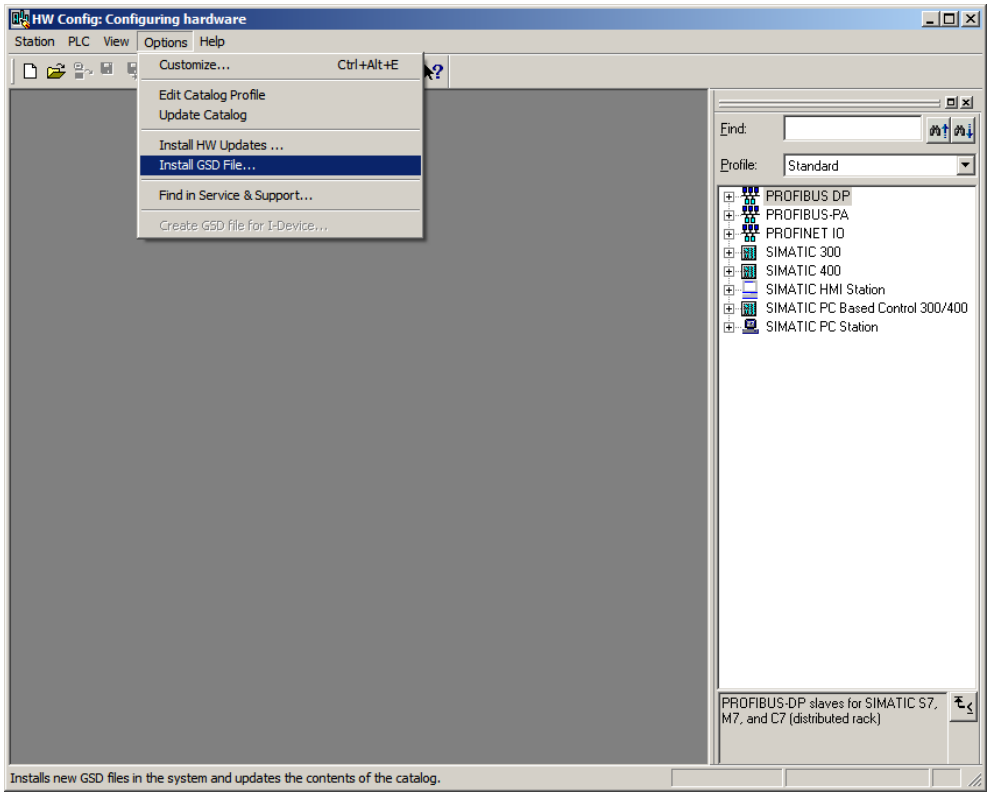
The name of the device master file for the KAS Profinet connection via the PN1 has the file name: GSDML-V2.2-KORA-PNIO2Prt-20150707.xml

12.2 GSD file installation under SIMATIC STEP 7

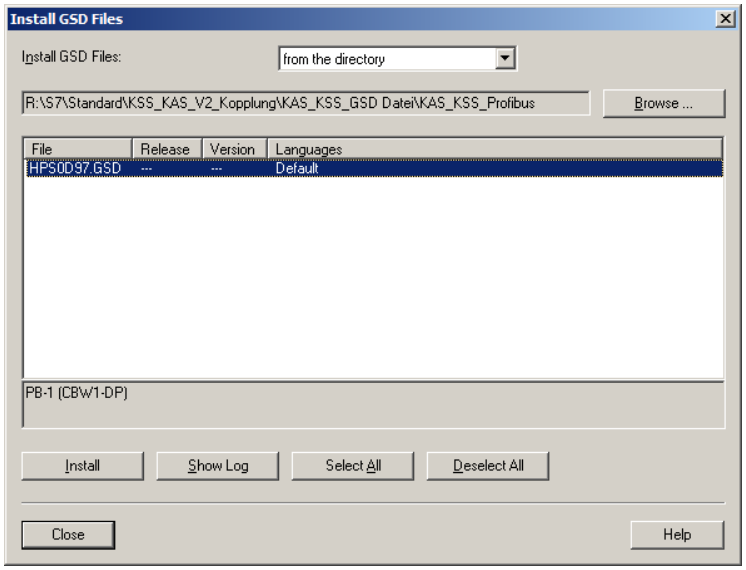
The hardware configuration of the SIMATIC manager has to be used for the installation of the GSD file under S7.

First open the hardware configuration.

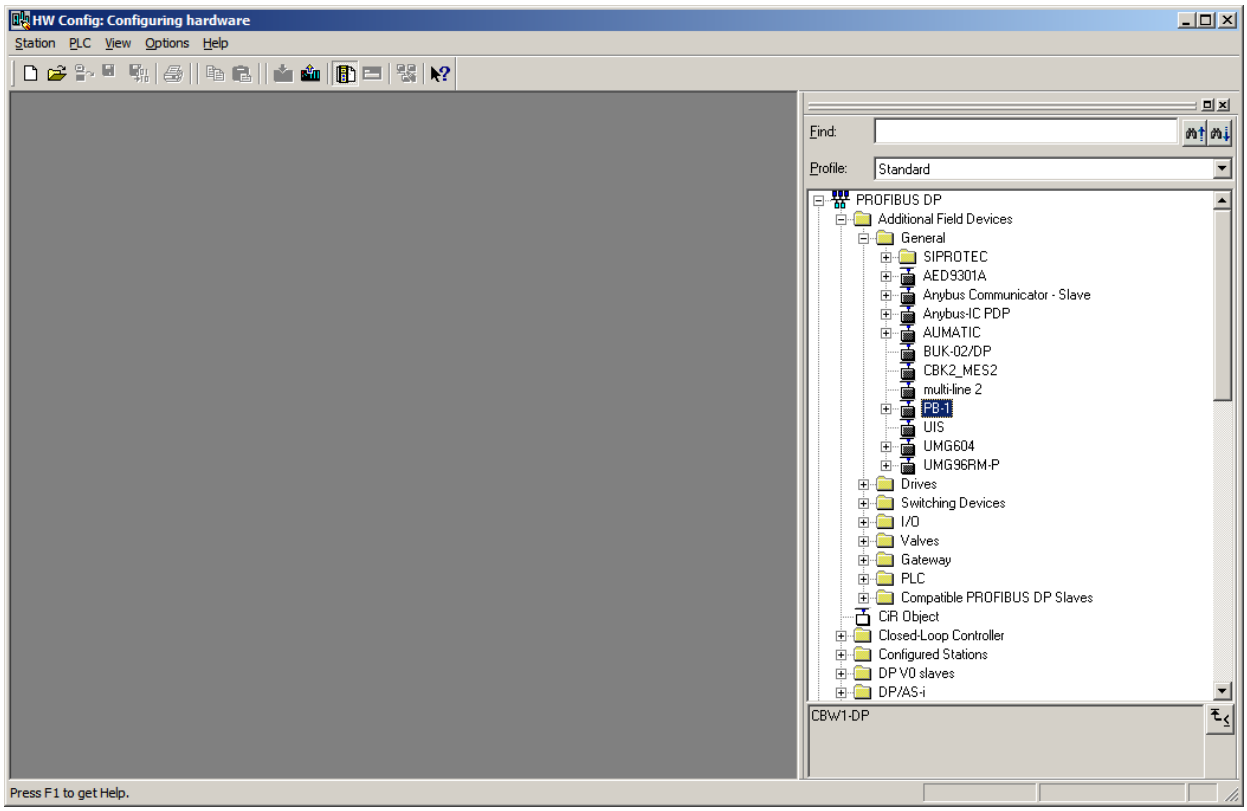
For installation please select Tools – Install GSD files.



GSD file selection

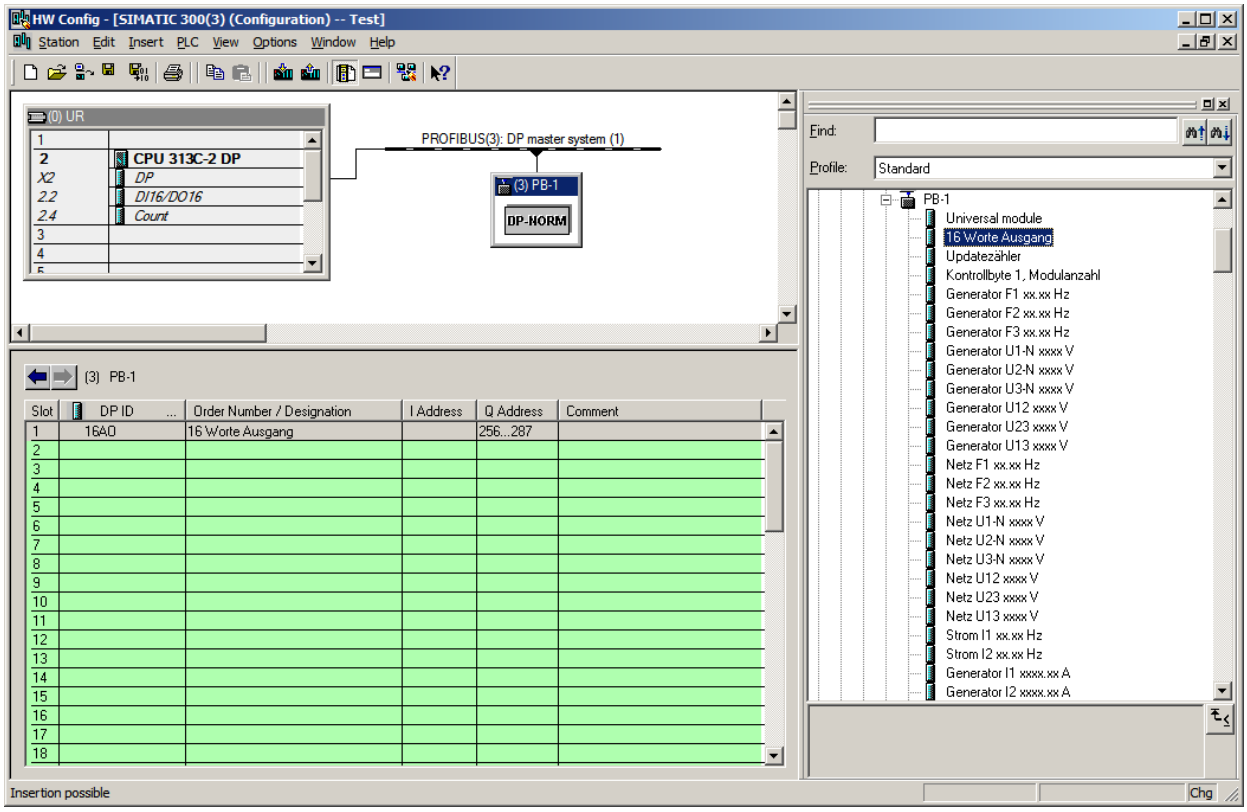


After installation the GSD file can be found in the directory ProfibusDP/ Further field devices/ General, and is named PB-1.



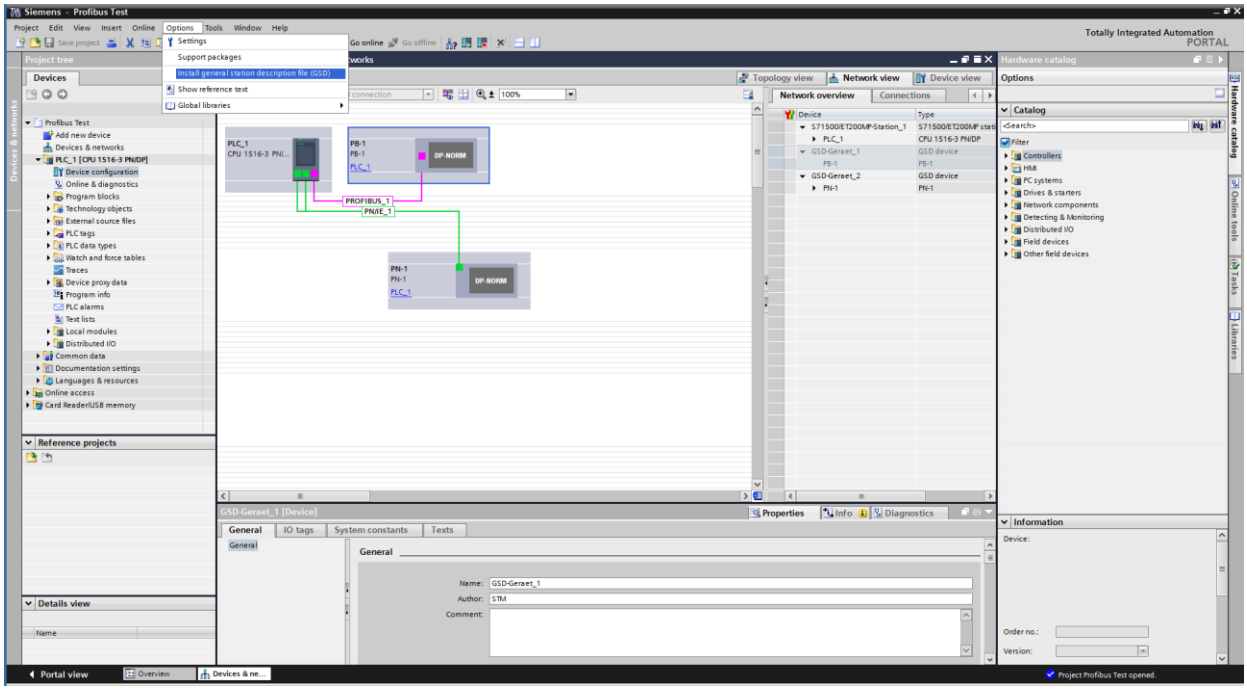
12.3 How to use the GSD file in the S7 project

After installation the Profibus DP participant will be integrated into the project configuration.
It is now possible to select the required data from the respective modules.

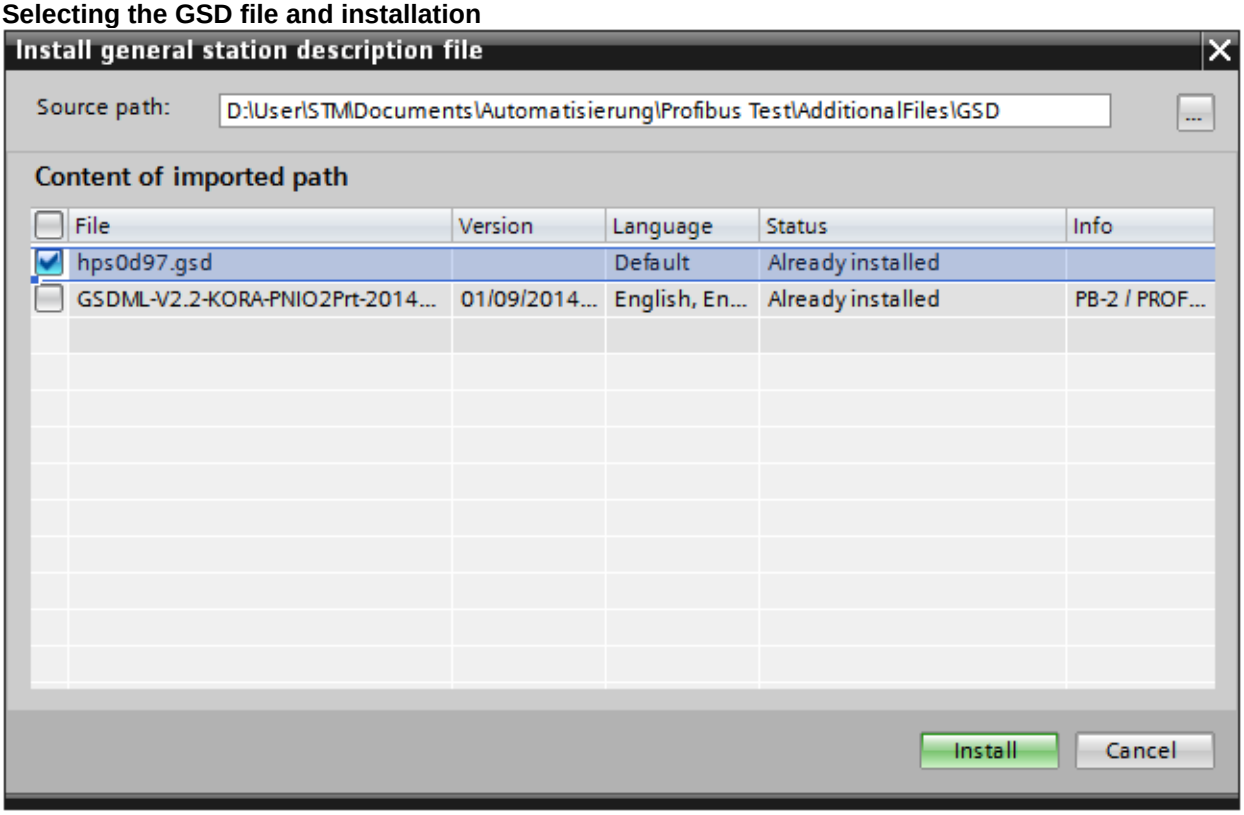


12.4 Installing the GSD file in SIMATIC TIA Portal

The installation of the GSD file under the TIA Portal via Install general station description.



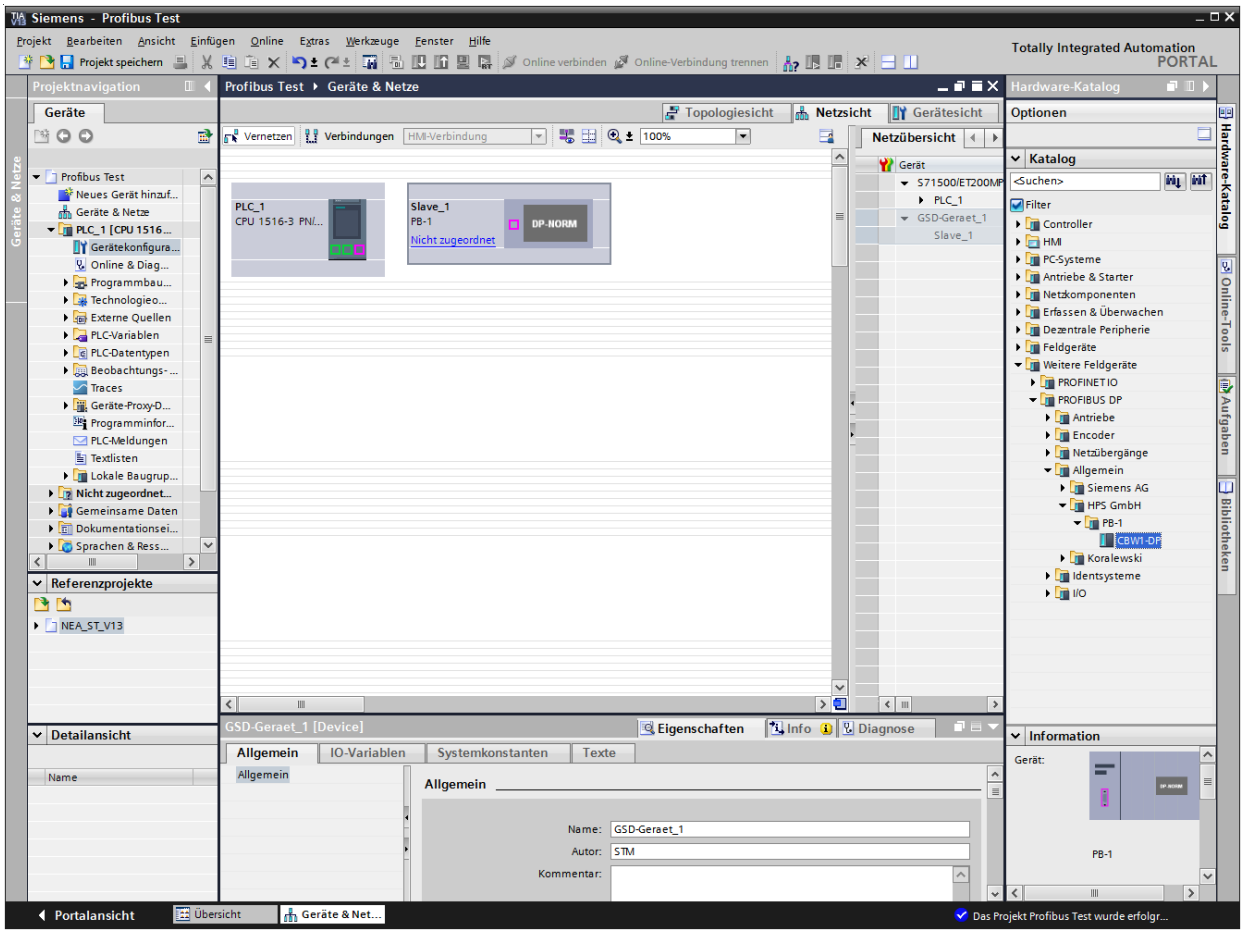
Selecting the GSD file and installation



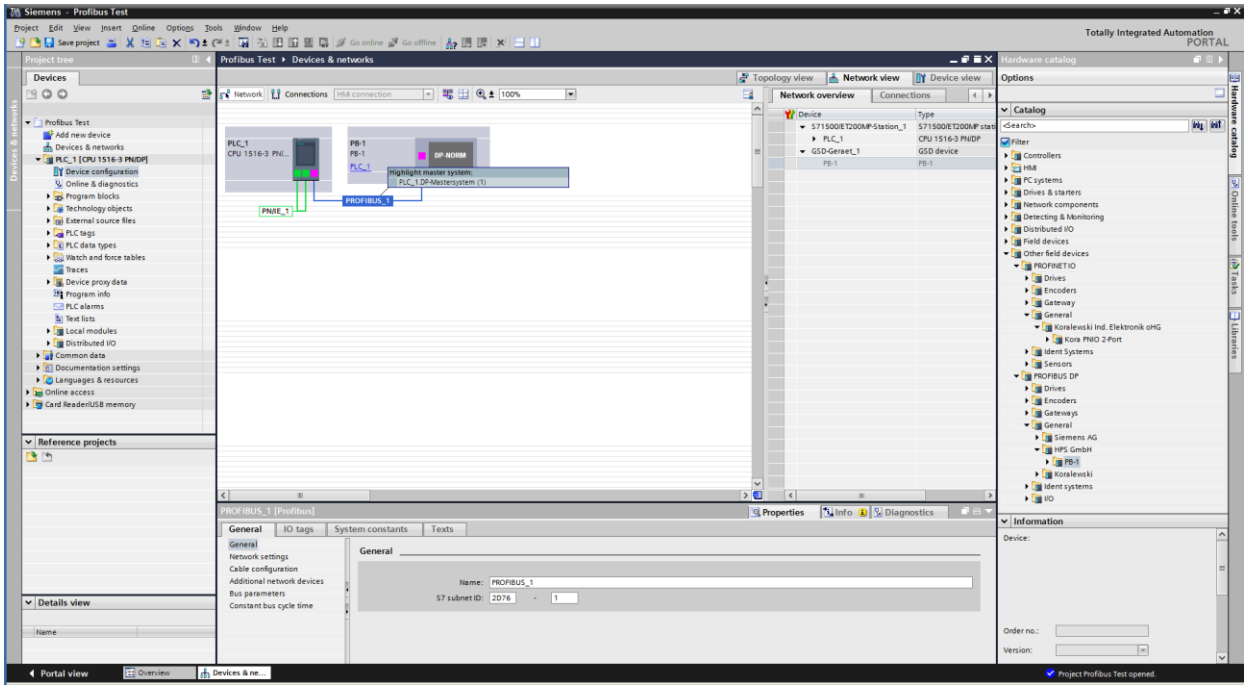
Application of the GSD file in the TIA Project

After the installation is the GSD file in the hardware catalogue under other field devices/ Profibus DP/General/HPS GmbH and has the name PB-1.

To integrate the Profibus DP node in the configuration of the project, the network view is to choose and select the PB-1 module.

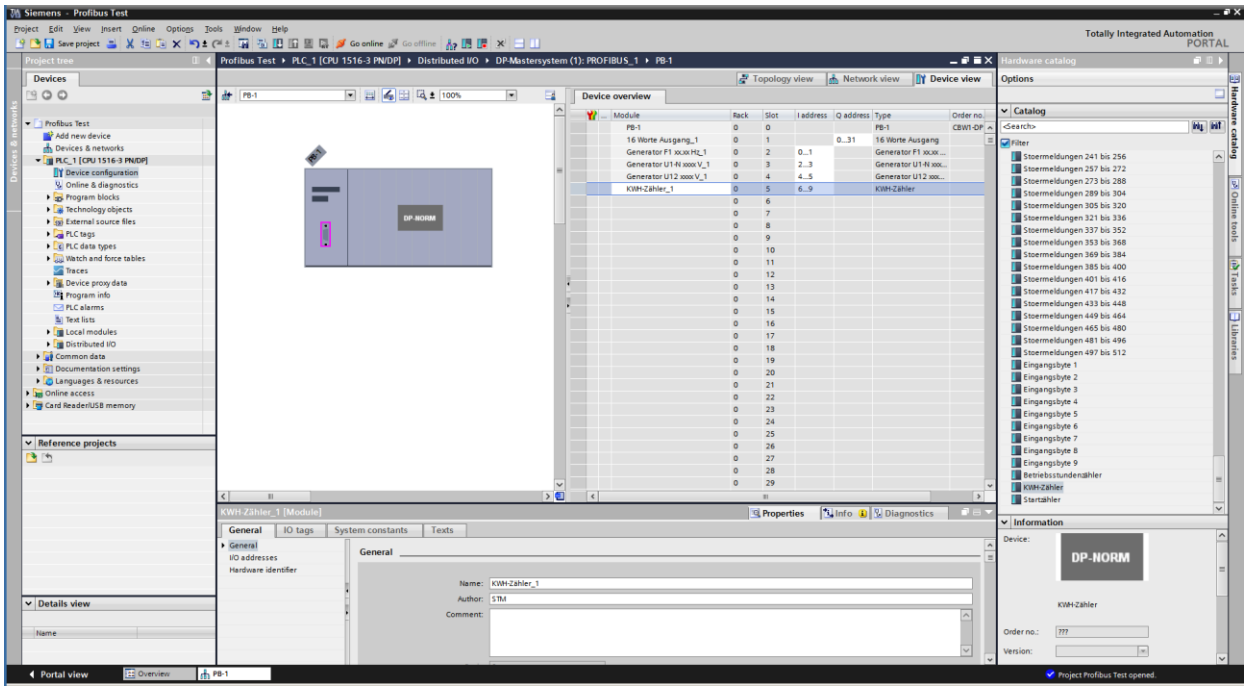


Now the PB-1 module with the corresponding master CPU must be connected.



It is then one determine the station address.

In the device view of the PB-1 module, it is now possible from the corresponding modules select the required data.



12.5 Profinet

The Profinetkonfiguration takes place as the Profibuskonfigurtion similarly.

13 Data transfer modules outputs

If the remote control function is required, the digital input for remote control has to be set via PB1 or PN1.

Please observe the basic safety regulations.

If the bit is set to external setpoint, then the input via the analog setpoint value is used as the setpoint.

	Modul - GSD-File	Description / Factor		Length	PB1	PN1	Type
Operation mode „OFF“	1 – 16 Worte Ausgang	Select operation mode „OFF“		Byte	0x6F Byte0 / Bit0	0x00D0	Bool
Operation mode „HAND“	1 - 16 Worte Ausgang	Select operation mode „HAND“		Byte	0x6F Byte0 / Bit1	0x00D0	Bool
Operation mode „TEST“	1 - 16 Worte Ausgang	Select operation mode „TEST“		Byte	0x6F Byte0 / Bit2	0x00D0	Bool
Operation mode „AUTO“	1 - 16 Worte Ausgang	Select operation mode „AUTO“		Byte	0x6F Byte0 / Bit3	0x00D0	Bool
Start	1 - 16 Worte Ausgang	Motor start in operation mode „Hand“		Byte	0x6F Byte0 / Bit4	0x00D0	Bool
Change setpoint	1 - 16 Worte Ausgang	Power setpoint extern(1) / intern(0)		Byte	0x6F Byte0 / Bit5	0x00D0	Bool
Acknowledge	1 - 16 Worte Ausgang	Switch off the buzzer		Byte	0x6F Byte0 / Bit6	0x00D0	Bool
Reset	1 - 16 Worte Ausgang	Reset von Error messages		Byte	0x6F Byte0 / Bit7	0x00D0	Bool
GCB On	1 - 16 Worte Ausgang	Switching on the GCB		Byte	0x6F Byte1 / Bit0	0x00D1	Bool
GCB Off	1 - 16 Worte Ausgang	Switching off the GCB		Byte	0x6F Byte1 / Bit1	0x00D1	Bool
MCB On	1 - 16 Worte Ausgang	Switching on the MCB		Byte	0x6F Byte1 / Bit2	0x00D1	Bool
MCB Off	1 - 16 Worte Ausgang	Switching off the MCB		Byte	0x6F Byte1 / Bit3	0x00D1	Bool
Free	1 - 16 Worte Ausgang			Byte	0x6F Byte1 / Bit4	0x00D1	Bool
Remote start	1 - 16 Worte Ausgang	Remote start command in „AUTO“		Byte	0x6F Byte1 / Bit5	0x00D1	Bool
Free	1 - 16 Worte Ausgang			Byte	0x6F Byte1 / Bit6	0x00D1	Bool
Signal test	1 - 16 Worte Ausgang	Signal test		Byte	0x6F Byte1 / Bit7	0x00D1	Bool
Free				Byte	0x6F Byte2 / Bit0	0x00D2	Bool
Free				Byte	0x6F Byte2 / Bit1	0x00D2	Bool
Free				Byte	0x6F Byte2 / Bit2	0x00D2	Bool
Free				Byte	0x6F Byte2 / Bit3	0x00D2	Bool
Free				Byte	0x6F Byte2 / Bit4	0x00D2	Bool
Free				Byte	0x6F Byte2 / Bit5	0x00D2	Bool
Free				Byte	0x6F Byte2 / Bit6	0x00D2	Bool
Free				Byte	0x6F Byte2 / Bit7	0x00D2	Bool
Free				Byte	0x6F Byte3 / Bit0	0x00D3	Bool
Free				Byte	0x6F Byte3 / Bit1	0x00D3	Bool
Free				Byte	0x6F Byte3 / Bit2	0x00D3	Bool
Free				Byte	0x6F Byte3 / Bit3	0x00D3	Bool
Free				Byte	0x6F Byte3 / Bit4	0x00D3	Bool
Free				Byte	0x6F Byte3 / Bit5	0x00D3	Bool
Free				Byte	0x6F Byte3 / Bit6	0x00D3	Bool
Free				Byte	0x6F Byte3 / Bit7	0x00D3	Bool
Free				Byte	0x6F Byte4 / Bit0	0x00D4	Bool
Free				Byte	0x6F Byte4 / Bit1	0x00D4	Bool
Free				Byte	0x6F Byte4 / Bit2	0x00D4	Bool
Free				Byte	0x6F Byte4 / Bit3	0x00D4	Bool
Free				Byte	0x6F Byte4 / Bit4	0x00D4	Bool
Free				Byte	0x6F Byte4 / Bit5	0x00D4	Bool
Free				Byte	0x6F Byte4 / Bit6	0x00D4	Bool
Free				Byte	0x6F Byte4 / Bit7	0x00D4	Bool
Free				Byte	0x6F Byte5 / Bit0		Bool
Free				Byte	0x6F Byte5 / Bit1		Bool
Free				Byte	0x6F Byte5 / Bit2		Bool
Free				Byte	0x6F Byte5 / Bit3		Bool
Free				Byte	0x6F Byte5 / Bit4		Bool
Free				Byte	0x6F Byte5 / Bit5		Bool
Free				Byte	0x6F Byte5 / Bit6		Bool
Free				Byte	0x6F Byte5 / Bit7		Bool
Setpoint power	1 - 16 Worte Ausgang	‰	x0,1	Word	0x6F Byte6 + 7	0x00D5	INT
Free	1 - 16 Worte Ausgang			Word	0x6F Byte8 + 9	0x00D6	INT
Free	1 - 16 Worte Ausgang			Word	0x6F Byte10+11	0x00D7	INT
Free	1 - 16 Worte Ausgang			Word	0x6F Byte12+13	0x00D8	INT
Free	1 - 16 Worte Ausgang			Word	0x6F Byte14+15		INT

Free	1 - 16 Worte Ausgang			Word	0x6F	Byte 16 + 17	INT
Free	1 - 16 Worte Ausgang			Word	0x6F	Byte 18 + 19	INT
Free	1 - 16 Worte Ausgang			Word	0x6F	Byte 20 + 21	INT
Free	1 - 16 Worte Ausgang			Word	0x6F	Byte 22 + 23	INT
Free	1 - 16 Worte Ausgang			Word	0x6F	Byte 24 + 25	INT
Free	1 - 16 Worte Ausgang			Word	0x6F	Byte 26 + 27	INT
Free	1 - 16 Worte Ausgang			Word	0x6F	Byte 28 + 29	INT
Free	1 - 16 Worte Ausgang			Word	0x6F	Byte 30 + 31	INT

14 Data transfer input modules

14.1 ProfibusDP (L2-Bus)

	Modul - GSD-File	Description / Factor	Length	PB1		
Update counter	2 - Updatezähler	xxxx xxxx xxxx 1111 -> Flow counter 1 to 15 1xxx xxxx -> Internal Bus OK(0 at fault)	Byte	0x0097		
Control byte 1	3 - Kontrollbyte 1	Number of parameterized modules	Byte	0x0098		

14.2 CPU Module

	Modul - GSD-File	Description / Factor		Length	PB1	PN1	Type
Speed	114 - Drehzahl xxxx U/min	rpm	x1	Word	0x006E	0x0008	INT
Supply voltage	115 - Versorgungsspg. xx.x V	V	x0,01	Word	0x006F	0x0009	INT
Error messages 001-016	116 - Stoermeldungen 1 bis 16	Free input*		Word	0x0070	0x000A	Bool
Error messages 017-032	117 - Stoermeldungen 17 bis 32	Free input*		Word	0x0071	0x000B	Bool
Error message 033	118 - Stoermeldungen 33 bis 48	Free		Word	0x0072	0x000C	Bool
Error message 034	118 - Stoermeldungen 33 bis 48	Free		Word	0x0072	0x000C	Bool
Error message 035	118 - Stoermeldungen 33 bis 48	Free		Word	0x0072	0x000C	Bool
Error message 036	118 - Stoermeldungen 33 bis 48	Free		Word	0x0072	0x000C	Bool
Error message 037	118 - Stoermeldungen 33 bis 48	Free		Word	0x0072	0x000C	Bool
Error message 038	118 - Stoermeldungen 33 bis 48	Free		Word	0x0072	0x000C	Bool
Error message 039	118 - Stoermeldungen 33 bis 48	AL167 Supply UDC<		Word	0x0072	0x000C	Bool
Error message 040	118 - Stoermeldungen 33 bis 48	Free		Word	0x0072	0x000C	Bool
Error message 041	118 - Stoermeldungen 33 bis 48	Free		Word	0x0072	0x000C	Bool
Error message 042	118 - Stoermeldungen 33 bis 48	Free		Word	0x0072	0x000C	Bool
Error message 043	118 - Stoermeldungen 33 bis 48	Free		Word	0x0072	0x000C	Bool
Error message 044	118 - Stoermeldungen 33 bis 48	AL172 Syn time too long		Word	0x0072	0x000C	Bool
Error message 045	118 - Stoermeldungen 33 bis 48	AL173 Watchdog		Word	0x0072	0x000C	Bool
Error message 046	118 - Stoermeldungen 33 bis 48	AL174 Supply UDC>		Word	0x0072	0x000C	Bool
Error message 047	118 - Stoermeldungen 33 bis 48	Free		Word	0x0072	0x000C	Bool
Error message 048	118 - Stoermeldungen 33 bis 48	Free		Word	0x0072	0x000C	Bool
Error message 049	119 - Stoermeldungen 49 bis 64	AL177 Mains voltage <<		Word	0x0073	0x000D	Bool
Error message 050	119 - Stoermeldungen 49 bis 64	AL178 Mains voltage <		Word	0x0073	0x000D	Bool
Error message 051	119 - Stoermeldungen 49 bis 64	AL179 Mains voltage >		Word	0x0073	0x000D	Bool
Error message 052	119 - Stoermeldungen 49 bis 64	AL180 Mains voltage >>		Word	0x0073	0x000D	Bool
Error message 053	119 - Stoermeldungen 49 bis 64	AL181 Mains frequency <<		Word	0x0073	0x000D	Bool
Error message 054	119 - Stoermeldungen 49 bis 64	AL182 Mains frequency <		Word	0x0073	0x000D	Bool
Error message 055	119 - Stoermeldungen 49 bis 64	AL183 Mains frequency >		Word	0x0073	0x000D	Bool
Error message 056	119 - Stoermeldungen 49 bis 64	AL184 Mains frequency >>		Word	0x0073	0x000D	Bool
Error message 057	119 - Stoermeldungen 49 bis 64	AL185 Mains rotating field		Word	0x0073	0x000D	Bool
Error message 058	119 - Stoermeldungen 49 bis 64	AL186 Mains angle fault		Word	0x0073	0x000D	Bool
Error message 059	119 - Stoermeldungen 49 bis 64	AL187 Mains voltage asymmetry		Word	0x0073	0x000D	Bool
Error message 060	119 - Stoermeldungen 49 bis 64	Free		Word	0x0073	0x000D	Bool
Error message 061	119 - Stoermeldungen 49 bis 64	AL189 BDEW –U(t) Time is running		Word	0x0073	0x000D	Bool
Error message 062	119 - Stoermeldungen 49 bis 64	AL190 BDEW –U(t) Fault		Word	0x0073	0x000D	Bool
Error message 063	119 - Stoermeldungen 49 bis 64	Free		Word	0x0073	0x000D	Bool
Error message 064	119 - Stoermeldungen 49 bis 64	Free		Word	0x0073	0x000D	Bool

* See parameterization KSS

	Modul - GSD-File	Description / Factor	Length	PB1	PN1	Type
Error message 065	120 - Stoermeldungen 65 bis 80	AL193 Generator voltage <<	Word	0x0074	0x000E	Bool
Error message 066	120 - Stoermeldungen 65 bis 80	AL194 Generator voltage <	Word	0x0074	0x000E	Bool
Error message 067	120 - Stoermeldungen 65 bis 80	AL195 Generator voltage >	Word	0x0074	0x000E	Bool
Error message 068	120 - Stoermeldungen 65 bis 80	AL196 Generator voltage >>	Word	0x0074	0x000E	Bool
Error message 069	120 - Stoermeldungen 65 bis 80	AL197 Generator frequency <<	Word	0x0074	0x000E	Bool
Error message 070	120 - Stoermeldungen 65 bis 80	AL198 Generator frequency <	Word	0x0074	0x000E	Bool
Error message 071	120 - Stoermeldungen 65 bis 80	AL199 Generator frequency >	Word	0x0074	0x000E	Bool
Error message 072	120 - Stoermeldungen 65 bis 80	AL200 Generator frequency >>	Word	0x0074	0x000E	Bool
Error message 073	120 - Stoermeldungen 65 bis 80	AL201 Generator rotating field	Word	0x0074	0x000E	Bool
Error message 074	120 - Stoermeldungen 65 bis 80	AL202 Generator angle fault	Word	0x0074	0x000E	Bool
Error message 075	120 - Stoermeldungen 65 bis 80	AL203 Generator voltage asymmetry	Word	0x0074	0x000E	Bool
Error message 076	120 - Stoermeldungen 65 bis 80	AL204 Cos Phi capacitive	Word	0x0074	0x000E	Bool
Error message 077	120 - Stoermeldungen 65 bis 80	AL205 Cos Phi inductive	Word	0x0074	0x000E	Bool
Error message 078	120 - Stoermeldungen 65 bis 80	Free	Word	0x0074	0x000E	Bool
Error message 079	120 - Stoermeldungen 65 bis 80	Free	Word	0x0074	0x000E	Bool
Error message 080	120 - Stoermeldungen 65 bis 80	Free	Word	0x0074	0x000E	Bool
Error message 081	121 - Stoermeldungen 81 bis 96	AL209 Mains protection collective fault	Word	0x0075	0x000F	Bool
Error message 082	121 - Stoermeldungen 81 bis 96	AL210 Mains protection U<<	Word	0x0075	0x000F	Bool
Error message 083	121 - Stoermeldungen 81 bis 96	AL211 Mains protection U<	Word	0x0075	0x000F	Bool
Error message 084	121 - Stoermeldungen 81 bis 96	AL212 Mains protection U>	Word	0x0075	0x000F	Bool
Error message 085	121 - Stoermeldungen 81 bis 96	AL213 Mains protection U>>	Word	0x0075	0x000F	Bool
Error message 086	121 - Stoermeldungen 81 bis 96	AL214 Mains protection F<<	Word	0x0075	0x000F	Bool
Error message 087	121 - Stoermeldungen 81 bis 96	AL215 Mains protection F<	Word	0x0075	0x000F	Bool
Error message 088	121 - Stoermeldungen 81 bis 96	AL216 Mains protection F>	Word	0x0075	0x000F	Bool
Error message 089	121 - Stoermeldungen 81 bis 96	AL217 Mains protection F>>	Word	0x0075	0x000F	Bool
Error message 090	121 - Stoermeldungen 81 bis 96	AL218 Mains protection vector >	Word	0x0075	0x000F	Bool
Error message 091	121 - Stoermeldungen 81 bis 96	AL219 Mains protection vector >>	Word	0x0075	0x000F	Bool
Error message 092	121 - Stoermeldungen 81 bis 96	AL220 Dif vector surge >	Word	0x0075	0x000F	Bool
Error message 093	121 - Stoermeldungen 81 bis 96	AL221 Dif vector surge >>	Word	0x0075	0x000F	Bool
Error message 094	121 - Stoermeldungen 81 bis 96	AL222 Q-U protection <	Word	0x0075	0x000F	Bool
Error message 095	121 - Stoermeldungen 81 bis 96	AL223 Q-U protection <<	Word	0x0075	0x000F	Bool
Error message 096	121 - Stoermeldungen 81 bis 96	Free	Word	0x0075	0x000F	Bool
Error message 097	122 - Stoermeldungen 97 bis 112	AL225 Overcurrent I>	Word	0x0076	0x0010	Bool
Error message 098	122 - Stoermeldungen 97 bis 112	AL226 Overcurrent I>>	Word	0x0076	0x0010	Bool
Error message 099	122 - Stoermeldungen 97 bis 112	AL227 Overcurrent VDE0100-718	Word	0x0076	0x0010	Bool
Error message 100	122 - Stoermeldungen 97 bis 112	AL228 Overcurrent time protection	Word	0x0076	0x0010	Bool
Error message 101	122 - Stoermeldungen 97 bis 112	Free	Word	0x0076	0x0010	Bool
Error message 102	122 - Stoermeldungen 97 bis 112	Free	Word	0x0076	0x0010	Bool
Error message 103	122 - Stoermeldungen 97 bis 112	AL231 Power reduction fault	Word	0x0076	0x0010	Bool
Error message 104	122 - Stoermeldungen 97 bis 112	AL232 Power >>	Word	0x0076	0x0010	Bool
Error message 105	122 - Stoermeldungen 97 bis 112	AL233 Power >	Word	0x0076	0x0010	Bool
Error message 106	122 - Stoermeldungen 97 bis 112	AL234 Reverse power >	Word	0x0076	0x0010	Bool
Error message 107	122 - Stoermeldungen 97 bis 112	AL235 Reverse power >>	Word	0x0076	0x0010	Bool
Error message 108	122 - Stoermeldungen 97 bis 112	AL236 Apparent power >	Word	0x0076	0x0010	Bool
Error message 109	122 - Stoermeldungen 97 bis 112	AL237 Apparent power >>	Word	0x0076	0x0010	Bool
Error message 110	122 - Stoermeldungen 97 bis 112	AL238 Reactive power >	Word	0x0076	0x0010	Bool
Error message 111	122 - Stoermeldungen 97 bis 112	AL239 Reactive power >>	Word	0x0076	0x0010	Bool
Error message 112	122 - Stoermeldungen 97 bis 112	AL240 Unbalanced load	Word	0x0076	0x0010	Bool
Error message 113	123 - Stoermeldungen 113 bis 128	AL241 Diff current >	Word	0x0077	0x0012	Bool
Error message 114	123 - Stoermeldungen 113 bis 128	AL242 Diff current >>	Word	0x0077	0x0012	Bool
Error message 115	123 - Stoermeldungen 113 bis 128	AL243 VDE4105 Collective fault	Word	0x0077	0x0012	Bool
Error message 116	123 - Stoermeldungen 113 bis 128	AL244 VDE4105 U < (80%)	Word	0x0077	0x0012	Bool
Error message 117	123 - Stoermeldungen 113 bis 128	AL245 VDE4105 U > (115%)	Word	0x0077	0x0012	Bool
Error message 118	123 - Stoermeldungen 113 bis 128	AL246 VDE4105 F < (47,5Hz)	Word	0x0077	0x0012	Bool
Error message 119	123 - Stoermeldungen 113 bis 128	AL247 VDE4105 F > (51,5Hz)	Word	0x0077	0x0012	Bool
Error message 120	123 - Stoermeldungen 113 bis 128	AL248 VDE4105 U> (Quality)	Word	0x0077	0x0012	Bool
Error message 121	123 - Stoermeldungen 113 bis 128	AL249 Underspeed	Word	0x0077	0x0012	Bool
Error message 122	123 - Stoermeldungen 113 bis 128	AL250 Overspeed	Word	0x0077	0x0012	Bool
Error message 123	123 - Stoermeldungen 113 bis 128	AL251 AI1 Module 1 – AI05	Word	0x0077	0x0012	Bool
Error message 124	123 - Stoermeldungen 113 bis 128	AL252 AI1 Module 1 – AI06	Word	0x0077	0x0012	Bool
Error message 125	123 - Stoermeldungen 113 bis 128	AL253 AI1 Module 1 – AI07	Word	0x0077	0x0012	Bool
Error message 126	123 - Stoermeldungen 113 bis 128	AL254 AI1 Module 1 – AI08	Word	0x0077	0x0012	Bool
Error message 127	123 - Stoermeldungen 113 bis 128	AL255 AI1 Module 1 – AI09	Word	0x0077	0x0012	Bool
Error message 128	123 - Stoermeldungen 113 bis 128	AL256 AI1 Module 1 – AI10	Word	0x0077	0x0012	Bool

	Modul - GSD-File	Description / Factor		Length	PB1	PN1	Type
Analog input 1	124 - AnalogInput 1 xxx.x	Power setpoint value	x0,01	Word	0x0078	0x002B	INT
Analog input 2	125 - AnalogInput 2 xxx.x	Cos Phi setpoint value	x0,001	Word	0x0079	0x002C	INT
Analog output 1	126 - Analogausgang 1 xxx.x	See project planning	x1	Word	0x007A	0x002D	INT
Analog output 2	127 - Analogausgang 2 xxx.x	See project planning	x1	Word	0x007B	00002E	INT
Analog output 3	128 - Analogausgang 3 xxx.x	See project planning	x1	Word	0x007C	0x002F	INT
Analog output 4	129 - Analogausgang 4 xxx.x	See project planning	x1	Word	0x007D	0x0030	INT
Setpoint value 1	130 - Sollwert 1 xxx.x	Power setpoint value	x1	Word	0x007E	0x003E	INT
Setpoint value 2	131 - Sollwert 2 xxx.x	Cos Phi setpoint value	x1	Word	0x007F	0x003F	INT
Setpoint value 3	132 - Sollwert 3 xxx.x	Speed setpoint CAN	x1	Word	0x0080	0x0040	INT
Setpoint value 4	133 - Sollwert 4 xxx.x	Free	x1	Word	0x0081	0x0041	INT
Info word	134 - Info/Funktionswort CPU	Depending on STEUBYTEA01		Word	0x0082	0x0043	INT
Operation byte 1	135 - Betriebsbyte 1	Free		Byte	0x0083	0x0001	Bool
Operation byte 1	135 - Betriebsbyte 1	Free		Byte	0x0083	0x0001	Bool
Operation byte 1	135 - Betriebsbyte 1	Free		Byte	0x0083	0x0001	Bool
Operation byte 1	135 - Betriebsbyte 1	Free		Byte	0x0083	0x0001	Bool
Operation byte 1	135 - Betriebsbyte 1	Free		Byte	0x0083	0x0001	Bool
Operation byte 1	135 - Betriebsbyte 1	Internal setpoint value ON		Byte	0x0083	0x0001	Bool
Operation byte 1	135 - Betriebsbyte 1	Operation		Byte	0x0083	0x0001	Bool
Operation byte 1	135 - Betriebsbyte 1	Signal test		Byte	0x0083	0x0001	Bool
Operation byte 2	136 - Betriebsbyte 2	Gen CB ON		Byte	0x0084	0x0002	Bool
Operation byte 2	136 - Betriebsbyte 2	Mains CB ON		Byte	0x0084	0x0002	Bool
Operation byte 2	136 - Betriebsbyte 2	Impurity release dir.1		Byte	0x0084	0x0002	Bool
Operation byte 2	136 - Betriebsbyte 2	Mains parallel operation		Byte	0x0084	0x0002	Bool
Operation byte 2	136 - Betriebsbyte 2	50Hz regulation		Byte	0x0084	0x0002	Bool
Operation byte 2	136 - Betriebsbyte 2	DeltaF_release		Byte	0x0084	0x0002	Bool
Operation byte 2	136 - Betriebsbyte 2	Syn release		Byte	0x0084	0x0002	Bool
Operation byte 2	136 - Betriebsbyte 2	Load control ON		Byte	0x0084	0x0002	Bool
Operation byte 3	137 - Betriebsbyte 3	Free		Byte	0x0085	0x0003	Bool
Operation byte 3	137 - Betriebsbyte 3	Free		Byte	0x0085	0x0003	Bool
Operation byte 3	137 - Betriebsbyte 3	Free		Byte	0x0085	0x0003	Bool
Operation byte 3	137 - Betriebsbyte 3	Free		Byte	0x0085	0x0003	Bool
Operation byte 3	137 - Betriebsbyte 3	Speed down		Byte	0x0085	0x0003	Bool
Operation byte 3	137 - Betriebsbyte 3	Speed up		Byte	0x0085	0x0003	Bool
Operation byte 3	137 - Betriebsbyte 3	Speed governor reset		Byte	0x0085	0x0003	Bool
Operation byte 3	137 - Betriebsbyte 3	Free		Byte	0x0085	0x0003	Bool
Operation byte 4	138 - Betriebsbyte 4	Generator voltage		Byte	0x0086	0x0004	Bool
Operation byte 4	138 - Betriebsbyte 4	Mains voltage		Byte	0x0086	0x0004	Bool
Operation byte 4	138 - Betriebsbyte 4	Free		Byte	0x0086	0x0004	Bool
Operation byte 4	138 - Betriebsbyte 4	Free		Byte	0x0086	0x0004	Bool
Operation byte 4	138 - Betriebsbyte 4	Free		Byte	0x0086	0x0004	Bool
Operation byte 4	138 - Betriebsbyte 4	Free		Byte	0x0086	0x0004	Bool
Operation byte 4	138 - Betriebsbyte 4	Free		Byte	0x0086	0x0004	Bool
Operation byte 4	138 - Betriebsbyte 4	Free		Byte	0x0086	0x0004	Bool
Operation byte 5	139 - Betriebsbyte 5	Horn (new error message)		Byte	0x0087	0x0005	Bool
Operation byte 5	139 - Betriebsbyte 5	Collective fault		Byte	0x0087	0x0005	Bool
Operation byte 5	139 - Betriebsbyte 5	Mains protection release		Byte	0x0087	0x0005	Bool
Operation byte 5	139 - Betriebsbyte 5	CosPhi control ON		Byte	0x0087	0x0005	Bool
Operation byte 5	139 - Betriebsbyte 5	Voltage down		Byte	0x0087	0x0005	Bool
Operation byte 5	139 - Betriebsbyte 5	Voltage up		Byte	0x0087	0x0005	Bool
Operation byte 5	139 - Betriebsbyte 5	Voltage control reset		Byte	0x0087	0x0005	Bool
Operation byte 5	139 - Betriebsbyte 5	Diff protection blocking edge contr.		Byte	0x0087	0x0005	Bool
Operation byte 6	140 - Betriebsbyte 6	Override interlocking		Byte	0x0088	0x0006	Bool
Operation byte 6	140 - Betriebsbyte 6	Ready for operation		Byte	0x0088	0x0006	Bool
Operation byte 6	140 - Betriebsbyte 6	Free		Byte	0x0088	0x0006	Bool
Operation byte 6	140 - Betriebsbyte 6	Free		Byte	0x0088	0x0006	Bool
Operation byte 6	140 - Betriebsbyte 6	Initial connection release Pilot_FE		Byte	0x0088	0x0006	Bool
Operation byte 6	140 - Betriebsbyte 6	Free		Byte	0x0088	0x0006	Bool
Operation byte 6	140 - Betriebsbyte 6	Free		Byte	0x0088	0x0006	Bool
Operation byte 6	140 - Betriebsbyte 6	Free		Byte	0x0088	0x0006	Bool

	Modul - GSD-File	Description / Factor	Length	PB1	PN1	Type
Input byte 1	141 - Inputsbyte CPU	Acknowledge	Byte	0x0089	0x0007	Bool
Input byte 1	141 - Inputsbyte CPU	Reset	Byte	0x0089	0x0007	Bool
Input byte 1	141 - Inputsbyte CPU	Release synchronization	Byte	0x0089	0x0007	Bool
Input byte 1	141 - Inputsbyte CPU	Speed monitoring (pick-up)	Byte	0x0089	0x0007	Bool
Input byte 1	141 - Inputsbyte CPU	Free	Byte	0x0089	0x0007	Bool
Input byte 1	141 - Inputsbyte CPU	Free	Byte	0x0089	0x0007	Bool
Input byte 1	141 - Inputsbyte CPU	Free	Byte	0x0089	0x0007	Bool
Input byte 1	141 - Inputsbyte CPU	Free	Byte	0x0089	0x0007	Bool
Output byte 1	142 - Ausgangsbyte 1	DO101*	Byte	0x008A	0x0031	Bool
Output byte 1	142 - Ausgangsbyte 1	DO102*	Byte	0x008A	0x0031	Bool
Output byte 1	142 - Ausgangsbyte 1	DO103*	Byte	0x008A	0x0031	Bool
Output byte 1	142 - Ausgangsbyte 1	DO104*	Byte	0x008A	0x0031	Bool
Output byte 1	142 - Ausgangsbyte 1	DO105*	Byte	0x008A	0x0031	Bool
Output byte 1	142 - Ausgangsbyte 1	DO106*	Byte	0x008A	0x0031	Bool
Output byte 1	142 - Ausgangsbyte 1	DO107*	Byte	0x008A	0x0031	Bool
Output byte 1	142 - Ausgangsbyte 1	DO108*	Byte	0x008A	0x0031	Bool
Output byte 2	143 - Ausgangsbyte 2	DO109*	Byte	0x008B	0x0032	Bool
Output byte 2	143 - Ausgangsbyte 2	DO110*	Byte	0x008B	0x0032	Bool
Output byte 2	143 - Ausgangsbyte 2	DO111*	Byte	0x008B	0x0032	Bool
Output byte 2	143 - Ausgangsbyte 2	Free	Byte	0x008B	0x0032	Bool
Output byte 2	143 - Ausgangsbyte 2	Free	Byte	0x008B	0x0032	Bool
Output byte 2	143 - Ausgangsbyte 2	Free	Byte	0x008B	0x0032	Bool
Output byte 2	143 - Ausgangsbyte 2	Free	Byte	0x008B	0x0032	Bool
Output byte 2	143 - Ausgangsbyte 2	Free	Byte	0x008B	0x0032	Bool
Output byte 3	144 - Ausgangsbyte 3	DO201*	Byte	0x008C	0x0033	Bool
Output byte 3	144 - Ausgangsbyte 3	DO202*	Byte	0x008C	0x0033	Bool
Output byte 3	144 - Ausgangsbyte 3	DO203*	Byte	0x008C	0x0033	Bool
Output byte 3	144 - Ausgangsbyte 3	DO204*	Byte	0x008C	0x0033	Bool
Output byte 3	144 - Ausgangsbyte 3	DO205*	Byte	0x008C	0x0033	Bool
Output byte 3	144 - Ausgangsbyte 3	DO206*	Byte	0x008C	0x0033	Bool
Output byte 3	144 - Ausgangsbyte 3	DO207*	Byte	0x008C	0x0033	Bool
Output byte 3	144 - Ausgangsbyte 3	DO208*	Byte	0x008C	0x0033	Bool
Output byte 4	145 - Ausgangsbyte 4	DO209*	Byte	0x008D	0x0034	Bool
Output byte 4	145 - Ausgangsbyte 4	DO210*	Byte	0x008D	0x0034	Bool
Output byte 4	145 - Ausgangsbyte 4	DO211*	Byte	0x008D	0x0034	Bool
Output byte 4	145 - Ausgangsbyte 4	Free	Byte	0x008D	0x0034	Bool
Output byte 4	145 - Ausgangsbyte 4	Free	Byte	0x008D	0x0034	Bool
Output byte 4	145 - Ausgangsbyte 4	Free	Byte	0x008D	0x0034	Bool
Output byte 4	145 - Ausgangsbyte 4	Free	Byte	0x008D	0x0034	Bool
Output byte 4	145 - Ausgangsbyte 4	Free	Byte	0x008D	0x0034	Bool
Output byte 5	146 - Ausgangsbyte 5	Free	Byte	0x008E	0x0035	Bool
Output byte 5	146 - Ausgangsbyte 5	Free	Byte	0x008E	0x0035	Bool
Output byte 5	146 - Ausgangsbyte 5	Free	Byte	0x008E	0x0035	Bool
Output byte 5	146 - Ausgangsbyte 5	Free	Byte	0x008E	0x0035	Bool
Output byte 5	146 - Ausgangsbyte 5	Free	Byte	0x008E	0x0035	Bool
Output byte 5	146 - Ausgangsbyte 5	Free	Byte	0x008E	0x0035	Bool
Output byte 5	146 - Ausgangsbyte 5	Free	Byte	0x008E	0x0035	Bool
Output byte 5	146 - Ausgangsbyte 5	Free	Byte	0x008E	0x0035	Bool
Output byte 6	147 - Ausgangsbyte 6	Free	Byte	0x008F	0x0036	Bool
Output byte 6	147 - Ausgangsbyte 6	Free	Byte	0x008F	0x0036	Bool
Output byte 6	147 - Ausgangsbyte 6	Free	Byte	0x008F	0x0036	Bool
Output byte 6	147 - Ausgangsbyte 6	Free	Byte	0x008F	0x0036	Bool
Output byte 6	147 - Ausgangsbyte 6	Free	Byte	0x008F	0x0036	Bool
Output byte 6	147 - Ausgangsbyte 6	Free	Byte	0x008F	0x0036	Bool
Output byte 6	147 - Ausgangsbyte 6	Free	Byte	0x008F	0x0036	Bool
Output byte 6	147 - Ausgangsbyte 6	Free	Byte	0x008F	0x0036	Bool
Output byte 7	148 - Ausgangsbyte 7	Free	Byte	0x0090	0x0037	Bool
Output byte 7	148 - Ausgangsbyte 7	Free	Byte	0x0090	0x0037	Bool
Output byte 7	148 - Ausgangsbyte 7	Free	Byte	0x0090	0x0037	Bool
Output byte 7	148 - Ausgangsbyte 7	Free	Byte	0x0090	0x0037	Bool
Output byte 7	148 - Ausgangsbyte 7	Free	Byte	0x0090	0x0037	Bool
Output byte 7	148 - Ausgangsbyte 7	Free	Byte	0x0090	0x0037	Bool
Output byte 7	148 - Ausgangsbyte 7	Free	Byte	0x0090	0x0037	Bool
Output byte 7	148 - Ausgangsbyte 7	Free	Byte	0x0090	0x0037	Bool

* See parameterization KSS

	Modul - GSD-File	Description / Factor	Length	PB1	PN1	Type
Output byte 8	149 - Ausgangsbyte 8	Free	Byte	0x0091	0x0038	Bool
Output byte 8	149 - Ausgangsbyte 8	Free	Byte	0x0091	0x0038	Bool
Output byte 8	149 - Ausgangsbyte 8	Free	Byte	0x0091	0x0038	Bool
Output byte 8	149 - Ausgangsbyte 8	Free	Byte	0x0091	0x0038	Bool
Output byte 8	149 - Ausgangsbyte 8	Free	Byte	0x0091	0x0038	Bool
Output byte 8	149 - Ausgangsbyte 8	Free	Byte	0x0091	0x0038	Bool
Output byte 8	149 - Ausgangsbyte 8	Free	Byte	0x0091	0x0038	Bool
Output byte 8	149 - Ausgangsbyte 8	Free	Byte	0x0091	0x0038	Bool
Output byte 9	150 - Ausgangsbyte 9	Free	Byte	0x0092	0x0039	Bool
Output byte 9	150 - Ausgangsbyte 9	Free	Byte	0x0092	0x0039	Bool
Output byte 9	150 - Ausgangsbyte 9	Free	Byte	0x0092	0x0039	Bool
Output byte 9	150 - Ausgangsbyte 9	Free	Byte	0x0092	0x0039	Bool
Output byte 9	150 - Ausgangsbyte 9	Free	Byte	0x0092	0x0039	Bool
Output byte 9	150 - Ausgangsbyte 9	Free	Byte	0x0092	0x0039	Bool
Output byte 9	150 - Ausgangsbyte 9	Free	Byte	0x0092	0x0039	Bool
Output byte 9	150 - Ausgangsbyte 9	Free	Byte	0x0092	0x0039	Bool
Output byte 10	151 - Ausgangsbyte 10	Free	Byte	0x0093	0x003A	Bool
Output byte 10	151 - Ausgangsbyte 10	Free	Byte	0x0093	0x003A	Bool
Output byte 10	151 - Ausgangsbyte 10	Free	Byte	0x0093	0x003A	Bool
Output byte 10	151 - Ausgangsbyte 10	Free	Byte	0x0093	0x003A	Bool
Output byte 10	151 - Ausgangsbyte 10	Free	Byte	0x0093	0x003A	Bool
Output byte 10	151 - Ausgangsbyte 10	Free	Byte	0x0093	0x003A	Bool
Output byte 10	151 - Ausgangsbyte 10	Free	Byte	0x0093	0x003A	Bool
Output byte 10	151 - Ausgangsbyte 10	Free	Byte	0x0093	0x003A	Bool
Output byte 11	152 - Ausgangsbyte 11	PM1 - DO01 – Mains/busbar fault	Byte	0x0094	0x003B	Bool
Output byte 11	152 - Ausgangsbyte 11	PM1 - DO02 – Generator voltage available	Byte	0x0094	0x003B	Bool
Output byte 11	152 - Ausgangsbyte 11	PM1 - DO03 – Mains protection collect fault	Byte	0x0094	0x003B	Bool
Output byte 11	152 - Ausgangsbyte 11	PM1 - DO04 – SYN-Pulse	Byte	0x0094	0x003B	Bool
Output byte 11	152 - Ausgangsbyte 11	PM1 - DO05 – Mains protection MCB (NO)	Byte	0x0094	0x003B	Bool
Output byte 11	152 - Ausgangsbyte 11	PM1 - DO06 – Mains protection GCB (NC)	Byte	0x0094	0x003B	Bool
Output byte 11	152 - Ausgangsbyte 11	PM1 - DO07 – Collective fault (NC)	Byte	0x0094	0x003B	Bool
Output byte 11	152 - Ausgangsbyte 11	PM1 - DO08 – Watchdog (NC)	Byte	0x0094	0x003B	Bool
Output byte 12	153 - Ausgangsbyte 12	DM1 - DO11 – Diff current >	Byte	0x0095	0x003C	Bool
Output byte 12	153 - Ausgangsbyte 12	DM1 - DO12 – Diff current >>	Byte	0x0095	0x003C	Bool
Output byte 12	153 - Ausgangsbyte 12	Free	Byte	0x0095	0x003C	Bool
Output byte 12	153 - Ausgangsbyte 12	LED1 on the tableau (DIG_LED1)*	Byte	0x0095	0x003C	Bool
Output byte 12	153 - Ausgangsbyte 12	LED2 on the tableau (DIG_LED2)*	Byte	0x0095	0x003C	Bool
Output byte 12	153 - Ausgangsbyte 12	LED3 on the tableau (DIG_LED3)*	Byte	0x0095	0x003C	Bool
Output byte 12	153 - Ausgangsbyte 12	LED4 on the tableau (DIG_LED4)*	Byte	0x0095	0x003C	Bool
Output byte 12	153 - Ausgangsbyte 12	LED5 on the tableau (DIG_LED5)*	Byte	0x0095	0x003C	Bool
Output byte 13	154 - Ausgangsbyte 13	ANZ – DO21 – Supply UDC<	Byte	0x0096	0x003D	Bool
Output byte 13	154 - Ausgangsbyte 13	Free	Byte	0x0096	0x003D	Bool
Output byte 13	154 - Ausgangsbyte 13	Free	Byte	0x0096	0x003D	Bool
Output byte 13	154 - Ausgangsbyte 13	Free	Byte	0x0096	0x003D	Bool
Output byte 13	154 - Ausgangsbyte 13	PB1 – DO31*	Byte	0x0096	0x003D	Bool
Output byte 13	154 - Ausgangsbyte 13	PB1 – DO32*	Byte	0x0096	0x003D	Bool
Output byte 13	154 - Ausgangsbyte 13	PN1 – DO33*	Byte	0x0096	0x003D	Bool
Output byte 13	154 - Ausgangsbyte 13	Free	Byte	0x0096	0x003D	Bool
Error message 129	174 - Stoermeldungen 129 bis 144	Free	Word	0x00AC	0x0013	Bool
Error message 130	174 - Stoermeldungen 129 bis 144	Free	Word	0x00AC	0x0013	Bool
Error message 131	174 - Stoermeldungen 129 bis 144	Free	Word	0x00AC	0x0013	Bool
Error message 132	174 - Stoermeldungen 129 bis 144	Free	Word	0x00AC	0x0013	Bool
Error message 133	174 - Stoermeldungen 129 bis 144	Free	Word	0x00AC	0x0013	Bool
Error message 134	174 - Stoermeldungen 129 bis 144	Free	Word	0x00AC	0x0013	Bool
Error message 135	174 - Stoermeldungen 129 bis 144	Free	Word	0x00AC	0x0013	Bool
Error message 136	174 - Stoermeldungen 129 bis 144	Free	Word	0x00AC	0x0013	Bool
Error message 137	174 - Stoermeldungen 129 bis 144	Free	Word	0x00AC	0x0013	Bool
Error message 138	174 - Stoermeldungen 129 bis 144	Free	Word	0x00AC	0x0013	Bool
Error message 139	174 - Stoermeldungen 129 bis 144	Free	Word	0x00AC	0x0013	Bool
Error message 140	174 - Stoermeldungen 129 bis 144	Free	Word	0x00AC	0x0013	Bool
Error message 141	174 - Stoermeldungen 129 bis 144	Free	Word	0x00AC	0x0013	Bool
Error message 142	174 - Stoermeldungen 129 bis 144	Free	Word	0x00AC	0x0013	Bool
Error message 143	174 - Stoermeldungen 129 bis 144	Free	Word	0x00AC	0x0013	Bool
Error message 144	174 - Stoermeldungen 129 bis 144	Free	Word	0x00AC	0x0013	Bool

* See parameterization KSS

	Modul - GSD-File	Description / Factor	Length	PB1	PN1	Type
Error message 145	175 - Stoermeldungen 145 bis 160	AL273 AT1 Modul1 – Input PT1 > *	Word	0x00AD	0x0014	Bool
Error message 146	175 - Stoermeldungen 145 bis 160	AL274 AT1 Modul1 – Input PT1 >> *	Word	0x00AD	0x0014	Bool
Error message 147	175 - Stoermeldungen 145 bis 160	AL275 AT1 Modul1 – Input PT2 > *	Word	0x00AD	0x0014	Bool
Error message 148	175 - Stoermeldungen 145 bis 160	AL276 AT1 Modul1 – Input PT2 >> *	Word	0x00AD	0x0014	Bool
Error message 149	175 - Stoermeldungen 145 bis 160	AL277 AT1 Modul1 – Input PT3 > *	Word	0x00AD	0x0014	Bool
Error message 150	175 - Stoermeldungen 145 bis 160	AL278 AT1 Modul1 – Input PT3 >> *	Word	0x00AD	0x0014	Bool
Error message 151	175 - Stoermeldungen 145 bis 160	AL279 AT1 Modul1 – Input PT4 > *	Word	0x00AD	0x0014	Bool
Error message 152	175 - Stoermeldungen 145 bis 160	AL280 AT1 Modul1 – Input PT4 >> *	Word	0x00AD	0x0014	Bool
Error message 153	175 - Stoermeldungen 145 bis 160	AL281 AT1 Modul1 – Input PT5 > *	Word	0x00AD	0x0014	Bool
Error message 154	175 - Stoermeldungen 145 bis 160	AL282 AT1 Modul1 – Input PT5 >> *	Word	0x00AD	0x0014	Bool
Error message 155	175 - Stoermeldungen 145 bis 160	AL283 AT1 Modul1 – Input PT6 > *	Word	0x00AD	0x0014	Bool
Error message 156	175 - Stoermeldungen 145 bis 160	AL284 AT1 Modul1 – Input PT6 >> *	Word	0x00AD	0x0014	Bool
Error message 157	175 - Stoermeldungen 145 bis 160	AL285 AT1 Modul1 – Input AI23 > *	Word	0x00AD	0x0014	Bool
Error message 158	175 - Stoermeldungen 145 bis 160	AL286 AT1 Modul1 – Input AI23 >> *	Word	0x00AD	0x0014	Bool
Error message 159	175 - Stoermeldungen 145 bis 160	AL 287 AT1 Modul1 – Input AI24 > *	Word	0x00AD	0x0014	Bool
Error message 160	175 - Stoermeldungen 145 bis 160	AL288 Modul1 – Input AI24 >> *	Word	0x00AD	0x0014	Bool
Error message 161	176 - Stoermeldungen 161 bis 176	Free	Word	0x00AE	0x0015	Bool
Error message 162	176 - Stoermeldungen 161 bis 176	Free	Word	0x00AE	0x0015	Bool
Error message 163	176 - Stoermeldungen 161 bis 176	Free	Word	0x00AE	0x0015	Bool
Error message 164	176 - Stoermeldungen 161 bis 176	Free	Word	0x00AE	0x0015	Bool
Error message 165	176 - Stoermeldungen 161 bis 176	Free	Word	0x00AE	0x0015	Bool
Error message 166	176 - Stoermeldungen 161 bis 176	Free	Word	0x00AE	0x0015	Bool
Error message 167	176 - Stoermeldungen 161 bis 176	Free	Word	0x00AE	0x0015	Bool
Error message 168	176 - Stoermeldungen 161 bis 176	Free	Word	0x00AE	0x0015	Bool
Error message 169	176 - Stoermeldungen 161 bis 176	Free	Word	0x00AE	0x0015	Bool
Error message 170	176 - Stoermeldungen 161 bis 176	Free	Word	0x00AE	0x0015	Bool
Error message 171	176 - Stoermeldungen 161 bis 176	Free	Word	0x00AE	0x0015	Bool
Error message 172	176 - Stoermeldungen 161 bis 176	Free	Word	0x00AE	0x0015	Bool
Error message 173	176 - Stoermeldungen 161 bis 176	Free	Word	0x00AE	0x0015	Bool
Error message 174	176 - Stoermeldungen 161 bis 176	Free	Word	0x00AE	0x0015	Bool
Error message 175	176 - Stoermeldungen 161 bis 176	Free	Word	0x00AE	0x0015	Bool
Error message 176	176 - Stoermeldungen 161 bis 176	Free	Word	0x00AE	0x0015	Bool
Error message 177	177 - Stoermeldungen 177 bis 192	Free	Word	0x00AF	0x0016	Bool
Error message 178	177 - Stoermeldungen 177 bis 192	Free	Word	0x00AF	0x0016	Bool
Error message 179	177 - Stoermeldungen 177 bis 192	Free	Word	0x00AF	0x0016	Bool
Error message 180	177 - Stoermeldungen 177 bis 192	Free	Word	0x00AF	0x0016	Bool
Error message 181	177 - Stoermeldungen 177 bis 192	Free	Word	0x00AF	0x0016	Bool
Error message 182	177 - Stoermeldungen 177 bis 192	Free	Word	0x00AF	0x0016	Bool
Error message 183	177 - Stoermeldungen 177 bis 192	Free	Word	0x00AF	0x0016	Bool
Error message 184	177 - Stoermeldungen 177 bis 192	Free	Word	0x00AF	0x0016	Bool
Error message 185	177 - Stoermeldungen 177 bis 192	Free	Word	0x00AF	0x0016	Bool
Error message 186	177 - Stoermeldungen 177 bis 192	Free	Word	0x00AF	0x0016	Bool
Error message 187	177 - Stoermeldungen 177 bis 192	Free	Word	0x00AF	0x0016	Bool
Error message 188	177 - Stoermeldungen 177 bis 192	Free	Word	0x00AF	0x0016	Bool
Error message 189	177 - Stoermeldungen 177 bis 192	Free	Word	0x00AF	0x0016	Bool
Error message 190	177 - Stoermeldungen 177 bis 192	Free	Word	0x00AF	0x0016	Bool
Error message 191	177 - Stoermeldungen 177 bis 192	Free	Word	0x00AF	0x0016	Bool
Error message 192	177 - Stoermeldungen 177 bis 192	Free	Word	0x00AF	0x0016	Bool
Error message 193	178 - Stoermeldungen 193 bis 208	Free	Word	0x00B0	0x0017	Bool
Error message 194	178 - Stoermeldungen 193 bis 208	Free	Word	0x00B0	0x0017	Bool
Error message 195	178 - Stoermeldungen 193 bis 208	Free	Word	0x00B0	0x0017	Bool
Error message 196	178 - Stoermeldungen 193 bis 208	Free	Word	0x00B0	0x0017	Bool
Error message 197	178 - Stoermeldungen 193 bis 208	Free	Word	0x00B0	0x0017	Bool
Error message 198	178 - Stoermeldungen 193 bis 208	Free	Word	0x00B0	0x0017	Bool
Error message 199	178 - Stoermeldungen 193 bis 208	Free	Word	0x00B0	0x0017	Bool
Error message 200	178 - Stoermeldungen 193 bis 208	Free	Word	0x00B0	0x0017	Bool
Error message 201	178 - Stoermeldungen 193 bis 208	Free	Word	0x00B0	0x0017	Bool
Error message 202	178 - Stoermeldungen 193 bis 208	Free	Word	0x00B0	0x0017	Bool
Error message 203	178 - Stoermeldungen 193 bis 208	Free	Word	0x00B0	0x0017	Bool
Error message 204	178 - Stoermeldungen 193 bis 208	Free	Word	0x00B0	0x0017	Bool
Error message 205	178 - Stoermeldungen 193 bis 208	Free	Word	0x00B0	0x0017	Bool
Error message 206	178 - Stoermeldungen 193 bis 208	Free	Word	0x00B0	0x0017	Bool
Error message 207	178 - Stoermeldungen 193 bis 208	Free	Word	0x00B0	0x0017	Bool
Error message 208	178 - Stoermeldungen 193 bis 208	Free	Word	0x00B0	0x0017	Bool

* See parameterization KSS

	Modul - GSD-File	Description / Factor		Length	PB1	PN1	Type
Error message 209	179 - Stoermeldungen 209 bis 224	Free		Word	0x00B1	0x0018	Bool
Error message 210	179 - Stoermeldungen 209 bis 224	Free		Word	0x00B1	0x0018	Bool
Error message 211	179 - Stoermeldungen 209 bis 224	Free		Word	0x00B1	0x0018	Bool
Error message 212	179 - Stoermeldungen 209 bis 224	Free		Word	0x00B1	0x0018	Bool
Error message 213	179 - Stoermeldungen 209 bis 224	Free		Word	0x00B1	0x0018	Bool
Error message 214	179 - Stoermeldungen 209 bis 224	Free		Word	0x00B1	0x0018	Bool
Error message 215	179 - Stoermeldungen 209 bis 224	Free		Word	0x00B1	0x0018	Bool
Error message 216	179 - Stoermeldungen 209 bis 224	Free		Word	0x00B1	0x0018	Bool
Error message 217	179 - Stoermeldungen 209 bis 224	Free		Word	0x00B1	0x0018	Bool
Error message 218	179 - Stoermeldungen 209 bis 224	Free		Word	0x00B1	0x0018	Bool
Error message 219	179 - Stoermeldungen 209 bis 224	Free		Word	0x00B1	0x0018	Bool
Error message 220	179 - Stoermeldungen 209 bis 224	Free		Word	0x00B1	0x0018	Bool
Error message 221	179 - Stoermeldungen 209 bis 224	Free		Word	0x00B1	0x0018	Bool
Error message 222	179 - Stoermeldungen 209 bis 224	Free		Word	0x00B1	0x0018	Bool
Error message 223	179 - Stoermeldungen 209 bis 224	Free		Word	0x00B1	0x0018	Bool
Error message 224	179 - Stoermeldungen 209 bis 224	Free		Word	0x00B1	0x0018	Bool
Error message 225	180 - Stoermeldungen 225 bis 240	Free		Word	0x00B2	0x0019	Bool
Error message 226	180 - Stoermeldungen 225 bis 240	Free		Word	0x00B2	0x0019	Bool
Error message 227	180 - Stoermeldungen 225 bis 240	Free		Word	0x00B2	0x0019	Bool
Error message 228	180 - Stoermeldungen 225 bis 240	Free		Word	0x00B2	0x0019	Bool
Error message 229	180 - Stoermeldungen 225 bis 240	Free		Word	0x00B2	0x0019	Bool
Error message 230	180 - Stoermeldungen 225 bis 240	Free		Word	0x00B2	0x0019	Bool
Error message 231	180 - Stoermeldungen 225 bis 240	Free		Word	0x00B2	0x0019	Bool
Error message 232	180 - Stoermeldungen 225 bis 240	Free		Word	0x00B2	0x0019	Bool
Error message 233	180 - Stoermeldungen 225 bis 240	Free		Word	0x00B2	0x0019	Bool
Error message 234	180 - Stoermeldungen 225 bis 240	Free		Word	0x00B2	0x0019	Bool
Error message 235	180 - Stoermeldungen 225 bis 240	Free		Word	0x00B2	0x0019	Bool
Error message 236	180 - Stoermeldungen 225 bis 240	Free		Word	0x00B2	0x0019	Bool
Error message 237	180 - Stoermeldungen 225 bis 240	Free		Word	0x00B2	0x0019	Bool
Error message 238	180 - Stoermeldungen 225 bis 240	Free		Word	0x00B2	0x0019	Bool
Error message 239	180 - Stoermeldungen 225 bis 240	Free		Word	0x00B2	0x0019	Bool
Error message 240	180 - Stoermeldungen 225 bis 240	Free		Word	0x00B2	0x0019	Bool
Error messages 241-255	181 - Stoermeldungen 241 bis 256	Free input*		Word	0x00B3	0x001A	Bool
Error message 256	181 - Stoermeldungen 241 bis 256	Blocked		Word	0x00B3	0x001A	Bool
Error message 257-272	182 - Stoermeldungen 257 bis 272	Not released in the SOP2/KSS		Word	0x00B4	0x001B	Bool
Error message 273-288	183 - Stoermeldungen 273 bis 288	Not released in the SOP2/KSS		Word	0x00B5	0x001C	Bool
Error message 289-304	184 - Stoermeldungen 289 bis 304	Not released in the SOP2/KSS		Word	0x00B6	0x001D	Bool
Error message 305-320	185 - Stoermeldungen 305 bis 320	Not released in the SOP2/KSS		Word	0x00B7	0x001E	Bool
Error message 321-336	186 - Stoermeldungen 321 bis 336	Not released in the SOP2/KSS		Word	0x00B8	0x001F	Bool
Error message 337-352	187 - Stoermeldungen 337 bis 352	Not released in the SOP2/KSS		Word	0x00B9	0x0020	Bool
Error message 353-368	188 - Stoermeldungen 353 bis 368	Not released in the SOP2/KSS		Word	0x00BA	0x0021	Bool
Error message 369-384	189 - Stoermeldungen 369 bis 384	Not released in the SOP2/KSS		Word	0x00BB	0x0022	Bool
Error message 385-400	190 - Stoermeldungen 385 bis 400	Not released in the SOP2/KSS		Word	0x00BC	0x0023	Bool
Error message 401-416	191 - Stoermeldungen 401 bis 416	Not released in the SOP2/KSS		Word	0x00BD	0x0024	Bool
Error message 417-432	192 - Stoermeldungen 417 bis 432	Not released in the SOP2/KSS		Word	0x00BE	0x0025	Bool
Error message 433-448	193 - Stoermeldungen 433 bis 448	Not released in the SOP2/KSS		Word	0x00BF	0x0026	Bool
Error message 449-464	194 - Stoermeldungen 449 bis 464	Not released in the SOP2/KSS		Word	0x00C0	0x0027	Bool
Error message 465-480	195 - Stoermeldungen 465 bis 480	Not released in the SOP2/KSS		Word	0x00C1	0x0028	Bool
Error message 481-496	196 - Stoermeldungen 481 bis 496	Not released in the SOP2/KSS		Word	0x00C2	0x0029	Bool
Error message 497-512	197 - Stoermeldungen 497 bis 512	Not released in the SOP2/KSS		Word	0x00C3	0x002A	Bool
KWH counter	207 – KWH-Zähler	kWh	x1	UDINT	0x00CD	0x00D9	DINT
Start counter	208 - Startzähler	Start(s)	x1	UDINT	0x00CE	0x00DA	DINT
Operation counter	209 - Betriebsstundenzähler	xxxxxxxx.xx h	x1	UDINT	0x00CF	0x00DB	DINT

* See parameterization KSS

14.3 PM1 Module

	Modul - GSD-File	Description / Factor		Length	PB1	PN1	Type
Generator frequency L1	4 - Generator F1 xx.xx Hz	Hz	x0,01	Word	0x0000	0x0066	INT
Generator frequency L2	5 - Generator F2 xx.xx Hz	Hz	x0,01	Word	0x0001	0x0067	INT
Generator frequency L3	6 - Generator F3 xx.xx Hz	Hz	x0,01	Word	0x0002	0x0068	INT
Generator voltage L1	7 - Generator U1-N xxxx V	V	x1	Word	0x0003	0x006C	INT
Generator voltage L2	8 - Generator U2-N xxxx V	V	x1	Word	0x0004	0x006D	INT
Generator voltage L3	9 - Generator U3-N xxxx V	V	x1	Word	0x0005	0x006E	INT
Generator voltage L1-2	10 - Generator U1-U2 xxxx V	V	x1	Word	0x0006	0x006F	INT
Generator voltage L2-3	11 - Generator U2-U3 xxxx V	V	x1	Word	0x0007	0x0070	INT
Generator voltage L3-1	12 - Generator U3-U1 xxxx V	V	x1	Word	0x0008	0x0071	INT
Mains/Bus frequency L1	13 - Netz F1 xx.xx Hz	Hz	x0,01	Word	0x0009	0x0079	INT
Mains/Bus frequency L2	14 - Netz F2 xx.xx Hz	Hz	x0,01	Word	0x000A	0x007A	INT
Mains/Bus frequency L3	15 - Netz F3 xx.xx Hz	Hz	x0,01	Word	0x000B	0x007B	INT
Mains/Bus voltage L1	16 - Netz U1-N xxxx V	V	x1	Word	0x000C	0x007F	INT
Mains/Bus voltage L2	17 - Netz U2-N xxxx V	V	x1	Word	0x000D	0x0080	INT
Mains/Bus voltage L3	18 - Netz U3-N xxxx V	V	x1	Word	0x000E	0x0081	INT
Mains/Bus voltage L1-2	19 - Netz U1-U2 xxxx V	V	x1	Word	0x000F	0x0082	INT
Mains/Bus voltage L2-3	20 - Netz U2-U3 xxxx V	V	x1	Word	0x0010	0x0083	INT
Mains/Bus voltage L3-1	21 - Netz U3-U1 xxxx V	V	x1	Word	0x0011	0x0084	INT
Freq. generator current L1	22 - Strom I1 xx.xx Hz	Hz	x0,01	Word	0x0012	0x008A	INT
Freq. generator current L2	23 - Strom I2 xx.xx Hz	Hz	x0,01	Word	0x0013	0x008B	INT
Generator current L1	24 - Generator I1 xxxx.xx A	A	x0,01	D-Word	0x0014	0x008D	DINT
Generator current L2	25 - Generator I2 xxxx.xx A	A	x0,01	D-Word	0x0015	0x008E	DINT
Generator current L3	26 - Generator I2 xxxx.xx A	A	x0,01	D-Word	0x0016	0x008F	DINT
Active power P1	27 - Generator P1 xxxx.xx kW	W	x0,01	D-Word	0x0017	0x0095	DINT
Active power P2	28 - Generator P2 xxxx.xx kW	W	x0,01	D-Word	0x0018	0x0096	DINT
Active power P3	29 - Generator P3 xxxx.xx kW	W	x0,01	D-Word	0x0019	0x0097	DINT
Apparent power S1	30 - Generator S1 xxxx.xx kVA	VA	x0,01	D-Word	0x001A	0x0098	DINT
Apparent power S2	31 - Generator S2 xxxx.xx kVA	VA	x0,01	D-Word	0x001B	0x0099	DINT
Apparent power S3	32 - Generator S3 xxxx.xx kVA	VA	x0,01	D-Word	0x001C	0x009A	DINT
Total active power	33 - Gen. Wirkleistung xxxx.xx kW	VA	x0,01	D-Word	0x001D	0x009B	DINT
Total reactive power	34 - Gen. Blindleistung xxxx.xx kVAR	VA	x0,01	D-Word	0x001E	0x009C	DINT
Total apparent power	35 - Gen. Scheinleistung xxxx.xx kVA	VA	x0,01	D-Word	0x001F	0x009D	DINT
Generator Cos Phi	36 - Generator CosPhi +/- 1.xxx		x0,001	Word	0x0020	0x009E	INT
Mains/Bus voltage L1	37 - Netz U1 xxx.x %	‰	x0,1	Word	0x0021	0x0085	INT
Mains/Bus voltage L2	38 - Netz U2 xxx.x %	‰	x0,1	Word	0x0022	0x0086	INT
Mains/Bus voltage L3	39 - Netz U3 xxx.x %	‰	x0,1	Word	0x0023	0x0087	INT
Generator voltage L1	40 - Generator U1 xxx.x %	‰	x0,1	Word	0x0024	0x0072	INT
Generator voltage L2	41 - Generator U2 xxx.x %	‰	x0,1	Word	0x0025	0x0073	INT
Generator voltage L3	42 - Generator U3 xxx.x %	‰	x0,1	Word	0x0026	0x0074	INT
Generator current L1	43 - Generator I1 xxx.x %	‰	x0,1	Word	0x0027	0x0090	INT
Generator current L2	44 - Generator I2 xxx.x %	‰	x0,1	Word	0x0028	0x0091	INT
Generator current L3	45 - Generator I3 xxx.x %	‰	x0,1	Word	0x0029	0x0092	INT
Generator active power P1	46 - Generator P1 xxx.x %	‰	x0,1	Word	0x002A	0x009F	INT
Generator active power P2	47 - Generator P2 xxx.x %	‰	x0,1	Word	0x002B	0x00A0	INT
Generator active power P3	48 - Generator P3 xxx.x %	‰	x0,1	Word	0x002C	0x00A1	INT
Generator apparent power S1	49 - Generator S1 xxx.x %	‰	x0,1	Word	0x002D	0x00A2	INT
Generator apparent power S2	50 - Generator S2 xxx.x %	‰	x0,1	Word	0x002E	0x00A3	INT
Generator apparent power S3	51 - Generator S3 xxx.x %	‰	x0,1	Word	0x002F	0x00A4	INT

	Modul - GSD-File	Description / Factor		Length	PB1	PN1	Type
Total apparent power	52 - Gen. Scheinleistung xxx.x %	‰	x0,1	Word	0x0030	0x00A5	INT
Total reactive power	53 - Gen. Blindleistung xxx.x %	‰	x0,1	Word	0x0031	0x00A6	INT
Total active power	54 - Gen. Gesamtleistung xxx.x %	‰	x0,1	Word	0x0032	0x00A7	INT
Generator voltage angle L1-2	55 - Gen. Winkel L1-2 xxx°	Degree	x1	Word	0x0033	0x0069	INT
Generator voltage angle L2-3	56 - Gen. Winkel L2-3 xxx°	Degree	x1	Word	0x0034	0x006A	INT
Generator voltage angle L3-1	57 - Gen. Winkel L3-1 xxx°	Degree	x1	Word	0x0035	0x006B	INT
Mains voltage angle L1-2	58 - Netz Winkel L1-2 xxx°	Degree	x1	Word	0x0036	0x007C	INT
Mains voltage angle L2-3	59 - Netz Winkel L2-3 xxx°	Degree	x1	Word	0x0037	0x007D	INT
Mains voltage angle L3-1	60 - Netz Winkel L3-1 xxx°	Degree	x1	Word	0x0038	0x007E	INT
Generator current angle L1-2	61 - Strom Winkel L1-2 xxx°	Degree	x1	Word	0x0039	0x008C	INT
Generator voltage byte	62 - Gen. Spannungsbyte	Generator detected voltage L1		Byte	0x003A	0x005F	Bool
Generator voltage byte	62 - Gen. Spannungsbyte	Generator detected voltage L2		Byte	0x003A	0x005F	Bool
Generator voltage byte	62 - Gen. Spannungsbyte	Generator detected voltage L3		Byte	0x003A	0x005F	Bool
Generator voltage byte	62 - Gen. Spannungsbyte	Nom. voltage detected L1+2+3		Byte	0x003A	0x005F	Bool
Generator voltage byte	62 - Gen. Spannungsbyte	Voltage >		Byte	0x003A	0x005F	Bool
Generator voltage byte	62 - Gen. Spannungsbyte	Voltage <		Byte	0x003A	0x005F	Bool
Generator voltage byte	62 - Gen. Spannungsbyte	Voltage >>		Byte	0x003A	0x005F	Bool
Generator voltage byte	62 - Gen. Spannungsbyte	Voltage <<		Byte	0x003A	0x005F	Bool
Generator frequency byte	63 - Gen. Frequenzbyte	Generator detected frequency L1		Byte	0x003B	0x0060	Bool
Generator frequency byte	63 - Gen. Frequenzbyte	Generator detected frequency L2		Byte	0x003B	0x0060	Bool
Generator frequency byte	63 - Gen. Frequenzbyte	Generator detected frequency L3		Byte	0x003B	0x0060	Bool
Generator frequency byte	63 - Gen. Frequenzbyte	Nom frequency detected L1+2+3		Byte	0x003B	0x0060	Bool
Generator frequency byte	63 - Gen. Frequenzbyte	Frequency >		Byte	0x003B	0x0060	Bool
Generator frequency byte	63 - Gen. Frequenzbyte	Frequency <		Byte	0x003B	0x0060	Bool
Generator frequency byte	63 - Gen. Frequenzbyte	Frequency >>		Byte	0x003B	0x0060	Bool
Generator frequency byte	63 - Gen. Frequenzbyte	Frequency <<		Byte	0x003B	0x0060	Bool
Mains protection byte	64 - Gen. Netzschutzbyte	Mains protection vector >		Byte	0x003C	0x0061	Bool
Mains protection byte	64 - Gen. Netzschutzbyte	Mains protection vector >>		Byte	0x003C	0x0061	Bool
Mains protection byte	64 - Gen. Netzschutzbyte	Mains protection U>		Byte	0x003C	0x0061	Bool
Mains protection byte	64 - Gen. Netzschutzbyte	Mains protection U<		Byte	0x003C	0x0061	Bool
Mains protection byte	64 - Gen. Netzschutzbyte	Mains protection F>		Byte	0x003C	0x0061	Bool
Mains protection byte	64 - Gen. Netzschutzbyte	Mains protection F<		Byte	0x003C	0x0061	Bool
Mains protection byte	64 - Gen. Netzschutzbyte	Mains protection collective fault		Byte	0x003C	0x0061	Bool
Mains protection byte	64 - Gen. Netzschutzbyte	Mains protection released		Byte	0x003C	0x0061	Bool
Generator vector byte 1	65 - Gen. Vektorbyte 1	Dif. vektor surge L1 > (plus)		Byte	0x003D	0x0062	Bool
Generator vector byte 1	65 - Gen. Vektorbyte 1	Dif. vektor surge L2 > (plus)		Byte	0x003D	0x0062	Bool
Generator vector byte 1	65 - Gen. Vektorbyte 1	Dif. vektor surge L3 > (plus)		Byte	0x003D	0x0062	Bool
Generator vector byte 1	65 - Gen. Vektorbyte 1	Dif. vektor surge L1 > (minus)		Byte	0x003D	0x0062	Bool
Generator vector byte 1	65 - Gen. Vektorbyte 1	Dif. vektor surge L2 > (minus)		Byte	0x003D	0x0062	Bool
Generator vector byte 1	65 - Gen. Vektorbyte 1	Dif. vektor surge L2 > (minus)		Byte	0x003D	0x0062	Bool
Generator vector byte 1	65 - Gen. Vektorbyte 1	Mains protection U<<		Byte	0x003D	0x0062	Bool
Generator vector byte 1	65 - Gen. Vektorbyte 1	Mains protection U>>		Byte	0x003D	0x0062	Bool
Generator vector byte 2	66 - Gen. Vektorbyte 2	Dif. vektor surge L1 >> (plus)		Byte	0x003E	0x0063	Bool
Generator vector byte 2	66 - Gen. Vektorbyte 2	Dif. vektor surge L2 >> (plus)		Byte	0x003E	0x0063	Bool
Generator vector byte 2	66 - Gen. Vektorbyte 2	Dif. vektor surge L3 >> (plus)		Byte	0x003E	0x0063	Bool
Generator vector byte 2	66 - Gen. Vektorbyte 2	Dif. vektor surge L1 >> (minus)		Byte	0x003E	0x0063	Bool
Generator vector byte 2	66 - Gen. Vektorbyte 2	Dif. vektor surge L2 >> (minus)		Byte	0x003E	0x0063	Bool
Generator vector byte 2	66 - Gen. Vektorbyte 2	Dif. vektor surge L2 >> (minus)		Byte	0x003E	0x0063	Bool
Generator vector byte 2	66 - Gen. Vektorbyte 2	Mains protection F<<		Byte	0x003E	0x0063	Bool
Generator vector byte 2	66 - Gen. Vektorbyte 2	Mains protection F>>		Byte	0x003E	0x0063	Bool
Generator angle byte	67 - Gen. Winkelbyte	Generator rotating field error		Byte	0x003F	0x0064	Bool
Generator angle byte	67 - Gen. Winkelbyte	Voltage angle error L1		Byte	0x003F	0x0064	Bool
Generator angle byte	67 - Gen. Winkelbyte	Voltage angle error L2		Byte	0x003F	0x0064	Bool
Generator angle byte	67 - Gen. Winkelbyte	Voltage angle error L3		Byte	0x003F	0x0064	Bool
Generator angle byte	67 - Gen. Winkelbyte	Voltage asymmetry		Byte	0x003F	0x0064	Bool
Generator angle byte	67 - Gen. Winkelbyte	Q-U protection <		Byte	0x003F	0x0064	Bool
Generator angle byte	67 - Gen. Winkelbyte	Cos Phi capazitive		Byte	0x003F	0x0064	Bool
Generator angle byte	67 - Gen. Winkelbyte	Cos Phi inductive		Byte	0x003F	0x0064	Bool

	Modul - GSD-File	Description / Factor	Length	PB1	PN1	Type
Synchronization byte	68 - Gen. Synchronisationsbyte	SYN-Pulse	Byte	0x0040	0x0065	Bool
Synchronization byte	68 - Gen. Synchronisationsbyte	Delta F OK	Byte	0x0040	0x0065	Bool
Synchronization byte	68 - Gen. Synchronisationsbyte	Delta U OK	Byte	0x0040	0x0065	Bool
Synchronization byte	68 - Gen. Synchronisationsbyte	Pulse voltage +	Byte	0x0040	0x0065	Bool
Synchronization byte	68 - Gen. Synchronisationsbyte	Pulse voltage -	Byte	0x0040	0x0065	Bool
Synchronization byte	68 - Gen. Synchronisationsbyte	Pulse frequency +	Byte	0x0040	0x0065	Bool
Synchronization byte	68 - Gen. Synchronisationsbyte	Pulse frequency -	Byte	0x0040	0x0065	Bool
Synchronization byte	68 - Gen. Synchronisationsbyte	Q-U protection <<	Byte	0x0040	0x0065	Bool
Mains voltage byte	69 - Netz Spannungsbyte	Mains voltage detected L1	Byte	0x0041	0x0075	Bool
Mains voltage byte	69 - Netz Spannungsbyte	Mains voltage detected L2	Byte	0x0041	0x0075	Bool
Mains voltage byte	69 - Netz Spannungsbyte	Mains voltage detected L3	Byte	0x0041	0x0075	Bool
Mains voltage byte	69 - Netz Spannungsbyte	Nom. Voltage detected L1+2+3	Byte	0x0041	0x0075	Bool
Mains voltage byte	69 - Netz Spannungsbyte	Voltage >	Byte	0x0041	0x0075	Bool
Mains voltage byte	69 - Netz Spannungsbyte	Voltage <	Byte	0x0041	0x0075	Bool
Mains voltage byte	69 - Netz Spannungsbyte	Voltage >>	Byte	0x0041	0x0075	Bool
Mains voltage byte	69 - Netz Spannungsbyte	Voltage <<	Byte	0x0041	0x0075	Bool
Mains frequency byte	70 - Netz Frequenzbyte	Mains frequency detected L1	Byte	0x0042	0x0076	Bool
Mains frequency byte	70 - Netz Frequenzbyte	Mains frequency detected L2	Byte	0x0042	0x0076	Bool
Mains frequency byte	70 - Netz Frequenzbyte	Mains frequency detected L3	Byte	0x0042	0x0076	Bool
Mains frequency byte	70 - Netz Frequenzbyte	Nom frequency detected L1+2+3	Byte	0x0042	0x0076	Bool
Mains frequency byte	70 - Netz Frequenzbyte	Frequency >	Byte	0x0042	0x0076	Bool
Mains frequency byte	70 - Netz Frequenzbyte	Frequency <	Byte	0x0042	0x0076	Bool
Mains frequency byte	70 - Netz Frequenzbyte	Frequency >>	Byte	0x0042	0x0076	Bool
Mains frequency byte	70 - Netz Frequenzbyte	Frequency <<	Byte	0x0042	0x0076	Bool
Mains angle byte	71 - Netz Drehfeldbyte	Mains rotating field error	Byte	0x0043	0x0078	Bool
Mains angle byte	71 - Netz Drehfeldbyte	Voltage angle error L1	Byte	0x0043	0x0078	Bool
Mains angle byte	71 - Netz Drehfeldbyte	Voltage angle error L2	Byte	0x0043	0x0078	Bool
Mains angle byte	71 - Netz Drehfeldbyte	Voltage angle error L3	Byte	0x0043	0x0078	Bool
Mains angle byte	71 - Netz Drehfeldbyte	Voltage asymmetry	Byte	0x0043	0x0078	Bool
Mains angle byte	71 - Netz Drehfeldbyte	Free	Byte	0x0043	0x0078	Bool
Mains angle byte	71 - Netz Drehfeldbyte	BDEW U(t) time is running	Byte	0x0043	0x0078	Bool
Mains angle byte	71 - Netz Drehfeldbyte	BDEW U(t) fault	Byte	0x0043	0x0078	Bool
Generator current byte 1	72 - Gen Strombyte	Generator current detected I1	Byte	0x0044	0x0088	Bool
Generator current byte 1	72 - Gen Strombyte	Generator current detected I2	Byte	0x0044	0x0088	Bool
Generator current byte 1	72 - Gen Strombyte	Generator current detected I3	Byte	0x0044	0x0088	Bool
Generator current byte 1	72 - Gen Strombyte	Nom. current detected L1+2+3	Byte	0x0044	0x0088	Bool
Generator current byte 1	72 - Gen Strombyte	Overcurrent >	Byte	0x0044	0x0088	Bool
Generator current byte 1	72 - Gen Strombyte	Overcurrent >>	Byte	0x0044	0x0088	Bool
Generator current byte 1	72 - Gen Strombyte	Overcurrent VDE100-718	Byte	0x0044	0x0088	Bool
Generator current byte 1	72 - Gen Strombyte	Overcurrent time protection	Byte	0x0044	0x0088	Bool
Generator power byte 1	73 - Gen. Leistungsbyte	Loaded	Byte	0x0045	0x0093	Bool
Generator power byte 1	73 - Gen. Leistungsbyte	Power >	Byte	0x0045	0x0093	Bool
Generator power byte 1	73 - Gen. Leistungsbyte	Power >>	Byte	0x0045	0x0093	Bool
Generator power byte 1	73 - Gen. Leistungsbyte	Reverse power >	Byte	0x0045	0x0093	Bool
Generator power byte 1	73 - Gen. Leistungsbyte	Reverse power >>	Byte	0x0045	0x0093	Bool
Generator power byte 1	73 - Gen. Leistungsbyte	Unbalanced load	Byte	0x0045	0x0093	Bool
Generator power byte 1	73 - Gen. Leistungsbyte	KWH Pulse	Byte	0x0045	0x0093	Bool
Generator power byte 1	73 - Gen. Leistungsbyte	Free	Byte	0x0045	0x0093	Bool
Generator power byte 2	74 - Gen. S/Q-byte	Apparent power >	Byte	0x0046	0x0094	Bool
Generator power byte 2	74 - Gen. S/Q-byte	Apparent power >>	Byte	0x0046	0x0094	Bool
Generator power byte 2	74 - Gen. S/Q-byte	Reactive power >	Byte	0x0046	0x0094	Bool
Generator power byte 2	74 - Gen. S/Q-byte	Reactive >>	Byte	0x0046	0x0094	Bool
Generator power byte 2	74 - Gen. S/Q-byte	Free	Byte	0x0046	0x0094	Bool
Generator power byte 2	74 - Gen. S/Q-byte	Free	Byte	0x0046	0x0094	Bool
Generator power byte 2	74 - Gen. S/Q-byte	Free	Byte	0x0046	0x0094	Bool
Generator power byte 2	74 - Gen. S/Q-byte	Free	Byte	0x0046	0x0094	Bool
Generator current byte 2	75 - Gen. Stromrichtungsbyte	Current rotating field right	Byte	0x0047	0x0089	Bool
Generator current byte 2	75 - Gen. Stromrichtungsbyte	Current rotating field left	Byte	0x0047	0x0089	Bool
Generator current byte 2	75 - Gen. Stromrichtungsbyte	Free	Byte	0x0047	0x0089	Bool
Generator current byte 2	75 - Gen. Stromrichtungsbyte	Free	Byte	0x0047	0x0089	Bool
Generator current byte 2	75 - Gen. Stromrichtungsbyte	Free	Byte	0x0047	0x0089	Bool
Generator current byte 2	75 - Gen. Stromrichtungsbyte	Free	Byte	0x0047	0x0089	Bool
Generator current byte 2	75 - Gen. Stromrichtungsbyte	Free	Byte	0x0047	0x0089	Bool
Generator current byte 2	75 - Gen. Stromrichtungsbyte	Free	Byte	0x0047	0x0089	Bool

	Modul - GSD-File	Description / Factor	Length	PB1	PN1	Type
VDE4105 NA-protection byte	173 - VDE4105 Zustandsbyte	VDE4105 Collective fault	Byte	0x00AB	0x0077	Bool
VDE4105 NA-protection byte	173 - VDE4105 Zustandsbyte	VDE4105 U< (80%)	Byte	0x00AB	0x0077	Bool
VDE4105 NA-protection byte	173 - VDE4105 Zustandsbyte	VDE4105 U> (115%)	Byte	0x00AB	0x0077	Bool
VDE4105 NA-protection byte	173 - VDE4105 Zustandsbyte	VDE4105 F< (47,5Hz)	Byte	0x00AB	0x0077	Bool
VDE4105 NA-protection byte	173 - VDE4105 Zustandsbyte	VDE4105 F> (51,5Hz)	Byte	0x00AB	0x0077	Bool
VDE4105 NA-protection byte	173 - VDE4105 Zustandsbyte	VDE4105 U> (Quality)	Byte	0x00AB	0x0077	Bool
VDE4105 NA-protection byte	173 - VDE4105 Zustandsbyte	Free	Byte	0x00AB	0x0077	Bool
VDE4105 NA-protection byte	173 - VDE4105 Zustandsbyte	VDE4105 Standby switching	Byte	0x00AB	0x0077	Bool

14.4 DM1 Module

	Modul - GSD-File	Description / Factor		Length	PB1	PN1	Type
Frequency int. current L1	76 - F intern Strom L1 xx.xx Hz	Hz	x0,01	Word	0x0048	0x00AD	INT
Frequency int. current L2	77 - F intern Strom L2 xx.xx Hz	Hz	x0,01	Word	0x0049	0x00AE	INT
Frequency ext. current L1	78 - F extern Strom L1 xx.xx Hz	Hz	x0,01	Word	0x0048	0x00AD	INT
Frequency ext. current L2	79 - F extern Strom L2 xx.xx Hz	Hz	x0,01	Word	0x0049	0x00AE	INT
Stable current L1	80 - stabiler Strom L1 xxx.xx A	A	x0,01	D-Word	0x004C	0x00C3	DINT
Stable current L2	81 - stabiler Strom L2 xxx.xx A	A	x0,01	D-Word	0x004D	0x00C4	DINT
Stable current L3	82 - stabiler Strom L2 xxx.xx A	A	x0,01	D-Word	0x004E	0x00C5	DINT
Current internal L1	83 - interner Strom L1 xxx.xx A	A	x0,01	D-Word	0x004F	0x00B2	DINT
Current internal L2	84 - interner Strom L2 xxx.xx A	A	x0,01	D-Word	0x0050	0x00B3	DINT
Current internal L3	85 - interner Strom L3 xxx.xx A	A	x0,01	D-Word	0x0051	0x00B4	DINT
Current external L1	86 - externer Strom L1 xxx.xx A	A	x0,01	D-Word	0x0052	0x00BD	DINT
Current external L2	87 - externer Strom L2 xxx.xx A	A	x0,01	D-Word	0x0053	0x00BE	DINT
Current external L3	88 - externer Strom L3 xxx.xx A	A	x0,01	D-Word	0x0054	0x00BF	DINT
Diff. current L1	89 - Differenz Strom L1 xxx.xx A	A	x0,01	D-Word	0x0055	0x00C6	DINT
Diff. current L2	90 - Differenz Strom L2 xxx.xx A	A	x0,01	D-Word	0x0056	0x00C7	DINT
Diff. current L3	91 - Differenz Strom L3 xxx.xx A	A	x0,01	D-Word	0x0057	0x00C8	DINT
Stable current L1	92 - stabiler Strom I1 xxx.x %	‰	x0,1	Word	0x0058	0x00C9	INT
Stable current L2	93 - stabiler Strom I2 xxx.x %	‰	x0,1	Word	0x0059	0x00CA	INT
Stable current L3	94 - stabiler Strom I3 xxx.x %	‰	x0,1	Word	0x005A	0x00CB	INT
Current internal L1	95 - interner Strom I1 xxx.x %	‰	x0,1	Word	0x005B	0x00B5	INT
Current internal L2	96 - interner Strom I2 xxx.x %	‰	x0,1	Word	0x005C	0x00B6	INT
Current internal L3	97 - interner Strom I3 xxx.x %	‰	x0,1	Word	0x005D	0x00B7	INT
Current external L1	98 - externer Strom I1 xxx.x %	‰	x0,1	Word	0x005E	0x00C0	INT
Current external L2	99 - externer Strom I2 xxx.x %	‰	x0,1	Word	0x005F	0x00C1	INT
Current external L3	100 - externer Strom I3 xxx.x %	‰	x0,1	Word	0x0060	0x00C2	INT
Diff. current L1	101 - Differenz Strom I1 xxx.x %	‰	x0,1	Word	0x0061	0x00CC	INT
Diff. current L2	102 - Differenz Strom I2 xxx.x %	‰	x0,1	Word	0x0062	0x00CD	INT
Diff. current L3	103 - Differenz Strom I3 xxx.x %	‰	x0,1	Word	0x0063	0x00CE	INT
Angle internal L1	104 - Winkel intern I1-I2 xxx°	Degree	x1	Word	0x0064	0x00AF	INT
Angle internal L2	105 - Winkel intern I2-I3 xxx°	Degree	x1	Word	0x0065	0x00B0	INT
Angle internal L3	106 - Winkel intern I3-I1 xxx°	Degree	x1	Word	0x0066	0x00B1	INT
Angle external L1	107 - Winkel extern I1-I2 xxx°	Degree	x1	Word	0x0067	0x00BA	INT
Angle external L2	108 - Winkel extern I2-I3 xxx°	Degree	x1	Word	0x0068	0x00BB	INT
Angle external L3	109 - Winkel extern I3-I1 xxx°	Degree	x1	Word	0x0069	0x00BC	INT
Angle internal/external L1	110 - Winkel intern/extern L1 xxx°	Degree	x1	Word	0x006A	0x00CF	INT

	Modul - GSD-File	Description / Factor	Length	PB1	PN1	Type
Diff. current byte internal	111 - Diff.byte Intern	Current internal detected I1	Byte	0x006B	0x00AA	Bool
Diff. current byte internal	111 - Diff.byte Intern	Current internal detected I2	Byte	0x006B	0x00AA	Bool
Diff. current byte internal	111 - Diff.byte Intern	Current internal detected I3	Byte	0x006B	0x00AA	Bool
Diff. current byte internal	111 - Diff.byte Intern	Nom. current detected L1+2+3	Byte	0x006B	0x00AA	Bool
Diff. current byte internal	111 - Diff.byte Intern	Free	Byte	0x006B	0x00AA	Bool
Diff. current byte internal	111 - Diff.byte Intern	Free	Byte	0x006B	0x00AA	Bool
Diff. current byte internal	111 - Diff.byte Intern	Diff current >	Byte	0x006B	0x00AA	Bool
Diff. current byte internal	111 - Diff.byte Intern	Diff current >>	Byte	0x006B	0x00AA	Bool
Diff. current byte external	112 - Diff.byte Extern	Current external detected I1	Byte	0x006C	0x00AB	Bool
Diff. current byte external	112 - Diff.byte Extern	Current external detected I2	Byte	0x006C	0x00AB	Bool
Diff. current byte external	112 - Diff.byte Extern	Current external detected I3	Byte	0x006C	0x00AB	Bool
Diff. current byte external	112 - Diff.byte Extern	Nom. current detected L1+2+3	Byte	0x006C	0x00AB	Bool
Diff. current byte external	112 - Diff.byte Extern	Free	Byte	0x006C	0x00AB	Bool
Diff. current byte external	112 - Diff.byte Extern	Free	Byte	0x006C	0x00AB	Bool
Diff. current byte external	112 - Diff.byte Extern	85% ID at 500% triggering off	Byte	0x006C	0x00AB	Bool
Diff. current byte external	112 - Diff.byte Extern	100% ID triggering off	Byte	0x006C	0x00AB	Bool
Diff. lock byte	113 - Diff. Sperrbyte	Triggering disabled via DI	Byte	0x006D	0x00AC	Bool
Diff. lock byte	113 - Diff. Sperrbyte	Triggering disabled Delta ID	Byte	0x006D	0x00AC	Bool
Diff. lock byte	113 - Diff. Sperrbyte	Free	Byte	0x006D	0x00AC	Bool
Diff. lock byte	113 - Diff. Sperrbyte	Free	Byte	0x006D	0x00AC	Bool
Diff. lock byte	113 - Diff. Sperrbyte	Free	Byte	0x006D	0x00AC	Bool
Diff. lock byte	113 - Diff. Sperrbyte	Free	Byte	0x006D	0x00AC	Bool
Diff. lock byte	113 - Diff. Sperrbyte	Free	Byte	0x006D	0x00AC	Bool
Diff. lock byte	113 - Diff. Sperrbyte	Free	Byte	0x006D	0x00AC	Bool

14.5 DI1 Module

	Modul - GSD-File	Description / Factor	Length	PB1	PN1	Type
Input byte 1	198 - Eingangsbyte 1	DI101*	Byte	0x00C4	0x0056	Bool
Input byte 1	198 - Eingangsbyte 1	DI102*	Byte	0x00C4	0x0056	Bool
Input byte 1	198 - Eingangsbyte 1	DI103*	Byte	0x00C4	0x0056	Bool
Input byte 1	198 - Eingangsbyte 1	DI104*	Byte	0x00C4	0x0056	Bool
Input byte 1	198 - Eingangsbyte 1	DI105*	Byte	0x00C4	0x0056	Bool
Input byte 1	198 - Eingangsbyte 1	DI106*	Byte	0x00C4	0x0056	Bool
Input byte 1	198 - Eingangsbyte 1	DI107*	Byte	0x00C4	0x0056	Bool
Input byte 1	198 - Eingangsbyte 1	DI108*	Byte	0x00C4	0x0056	Bool
Input byte 2	199- Eingangsbyte 2	DI109*	Byte	0x00C5	0x0057	Bool
Input byte 2	199- Eingangsbyte 2	DI110*	Byte	0x00C5	0x0057	Bool
Input byte 2	199- Eingangsbyte 2	DI111*	Byte	0x00C5	0x0057	Bool
Input byte 2	199- Eingangsbyte 2	DI112*	Byte	0x00C5	0x0057	Bool
Input byte 2	199- Eingangsbyte 2	DI113*	Byte	0x00C5	0x0057	Bool
Input byte 2	199- Eingangsbyte 2	DI114*	Byte	0x00C5	0x0057	Bool
Input byte 2	199- Eingangsbyte 2	DI115*	Byte	0x00C5	0x0057	Bool
Input byte 2	199- Eingangsbyte 2	DI116*	Byte	0x00C5	0x0057	Bool
Input byte 3	200 - Eingangsbyte 3	DI117*	Byte	0x00C6	0x0058	Bool
Input byte 3	200 - Eingangsbyte 3	DI118*	Byte	0x00C6	0x0058	Bool
Input byte 3	200 - Eingangsbyte 3	DI119*	Byte	0x00C6	0x0058	Bool
Input byte 3	200 - Eingangsbyte 3	DI120*	Byte	0x00C6	0x0058	Bool
Input byte 3	200 - Eingangsbyte 3	DI121*	Byte	0x00C6	0x0058	Bool
Input byte 3	200 - Eingangsbyte 3	DI122*	Byte	0x00C6	0x0058	Bool
Input byte 3	200 - Eingangsbyte 3	Free	Byte	0x00C6	0x0058	Bool
Input byte 3	200 - Eingangsbyte 3	Free	Byte	0x00C6	0x0058	Bool
Input byte 4	201 - Eingangsbyte 4	Free	Byte	0x00C7	0x0059	Bool
Input byte 4	201 - Eingangsbyte 4	Free	Byte	0x00C7	0x0059	Bool
Input byte 4	201 - Eingangsbyte 4	Free	Byte	0x00C7	0x0059	Bool
Input byte 4	201 - Eingangsbyte 4	Free	Byte	0x00C7	0x0059	Bool
Input byte 4	201 - Eingangsbyte 4	Free	Byte	0x00C7	0x0059	Bool
Input byte 4	201 - Eingangsbyte 4	Free	Byte	0x00C7	0x0059	Bool
Input byte 4	201 - Eingangsbyte 4	Free	Byte	0x00C7	0x0059	Bool
Input byte 4	201 - Eingangsbyte 4	Free	Byte	0x00C7	0x0059	Bool

* See parameterization KSS

	Modul - GSD-File	Description / Factor	Length	PB1	PN1	Type
Input byte 5	202 - Eingangsbyte 5	Free	Byte	0x00C8	0x005A	Bool
Input byte 5	202 - Eingangsbyte 5	Free	Byte	0x00C8	0x005A	Bool
Input byte 5	202 - Eingangsbyte 5	Free	Byte	0x00C8	0x005A	Bool
Input byte 5	202 - Eingangsbyte 5	Free	Byte	0x00C8	0x005A	Bool
Input byte 5	202 - Eingangsbyte 5	Free	Byte	0x00C8	0x005A	Bool
Input byte 5	202 - Eingangsbyte 5	Free	Byte	0x00C8	0x005A	Bool
Input byte 5	202 - Eingangsbyte 5	Free	Byte	0x00C8	0x005A	Bool
Input byte 5	202 - Eingangsbyte 5	Free	Byte	0x00C8	0x005A	Bool
Input byte 6	203 - Eingangsbyte 6	Free	Byte	0x00C9	0x005B	Bool
Input byte 6	203 - Eingangsbyte 6	Free	Byte	0x00C9	0x005B	Bool
Input byte 6	203 - Eingangsbyte 6	Free	Byte	0x00C9	0x005B	Bool
Input byte 6	203 - Eingangsbyte 6	Free	Byte	0x00C9	0x005B	Bool
Input byte 6	203 - Eingangsbyte 6	Free	Byte	0x00C9	0x005B	Bool
Input byte 6	203 - Eingangsbyte 6	Free	Byte	0x00C9	0x005B	Bool
Input byte 6	203 - Eingangsbyte 6	Free	Byte	0x00C9	0x005B	Bool
Input byte 6	203 - Eingangsbyte 6	Free	Byte	0x00C9	0x005B	Bool
Input byte 7	204 - Eingangsbyte 7	Free	Byte	0x00CA	0x005C	Bool
Input byte 7	204 - Eingangsbyte 7	Free	Byte	0x00CA	0x005C	Bool
Input byte 7	204 - Eingangsbyte 7	Free	Byte	0x00CA	0x005C	Bool
Input byte 7	204 - Eingangsbyte 7	Free	Byte	0x00CA	0x005C	Bool
Input byte 7	204 - Eingangsbyte 7	Free	Byte	0x00CA	0x005C	Bool
Input byte 7	204 - Eingangsbyte 7	Free	Byte	0x00CA	0x005C	Bool
Input byte 7	204 - Eingangsbyte 7	Free	Byte	0x00CA	0x005C	Bool
Input byte 7	204 - Eingangsbyte 7	Free	Byte	0x00CA	0x005C	Bool
Input byte 8	205 - Eingangsbyte 8	Free	Byte	0x00CB	0x005D	Bool
Input byte 8	205 - Eingangsbyte 8	Free	Byte	0x00CB	0x005D	Bool
Input byte 8	205 - Eingangsbyte 8	Free	Byte	0x00CB	0x005D	Bool
Input byte 8	205 - Eingangsbyte 8	Free	Byte	0x00CB	0x005D	Bool
Input byte 8	205 - Eingangsbyte 8	Free	Byte	0x00CB	0x005D	Bool
Input byte 8	205 - Eingangsbyte 8	Free	Byte	0x00CB	0x005D	Bool
Input byte 8	205 - Eingangsbyte 8	Free	Byte	0x00CB	0x005D	Bool
Input byte 8	205 - Eingangsbyte 8	Free	Byte	0x00CB	0x005D	Bool
Input byte 9	205 - Eingangsbyte 9	Free	Byte	0x00CC	0x005E	Bool
Input byte 9	205 - Eingangsbyte 9	Free	Byte	0x00CC	0x005E	Bool
Input byte 9	205 - Eingangsbyte 9	Free	Byte	0x00CC	0x005E	Bool
Input byte 9	205 - Eingangsbyte 9	Free	Byte	0x00CC	0x005E	Bool
Input byte 9	205 - Eingangsbyte 9	Free	Byte	0x00CC	0x005E	Bool
Input byte 9	205 - Eingangsbyte 9	Free	Byte	0x00CC	0x005E	Bool
Input byte 9	205 - Eingangsbyte 9	Free	Byte	0x00CC	0x005E	Bool
Input byte 9	205 - Eingangsbyte 9	Free	Byte	0x00CC	0x005E	Bool

* See parameterization KSS

14.6 AI1 Module

	Modul - GSD-File	Description / Factor	Length	PB1	PN1	Type
Analog input 5 (V/mA)	155 - Analogeingangswort U101	+/- 32767 *	INT	0x0099	0x0044	INT
Analog input 6 (V/mA)	156 - Analogeingangswort U102	+/- 32767 *	INT	0x009A	0x0045	INT
Analog input 7 (V/mA)	157 - Analogeingangswort U103	+/- 32767 *	INT	0x009B	0x0046	INT
Analog input 8 (V/mA)	158 - Analogeingangswort U104	+/- 32767 *	INT	0x009C	0x0047	INT
Analog input 9 (V/mA)	159 - Analogeingangswort U105	+/- 32767 *	INT	0x009D	0x0048	INT
Analog input 10 (V/mA)	160 - Analogeingangswort U106	+/- 32767 *	INT	0x009E	0x0049	INT
Analog input 11 (V/mA)	161 - Analogeingangswort U201	Free	INT	0x009F	0x004A	INT
Analog input 12 (V/mA)	162 - Analogeingangswort U202	Free	INT	0x00A0	0x004B	INT
Analog input 13 (V/mA)	163 - Analogeingangswort U203	Free	INT	0x00A1	0x004C	INT
Analog input 14 (V/mA)	164 - Analogeingangswort U204	Free	INT	0x00A2	0x004D	INT
Analog input 15 (V/mA)	165 - Analogeingangswort U205	Free	INT	0x00A3	0x004E	INT
Analog input 16 (V/mA)	166 - Analogeingangswort U206	Free	INT	0x00A4	0x004F	INT

* Unit and scaling is the parameterization refer to

	Modul - GSD-File	Description / Factor	Length	PB1	PN1	Type
Analog input 17 (V/mA)	167 - Analogeingangswort U301	Free	INT	0x00A5	0x0050	INT
Analog input 18 (V/mA)	168 - Analogeingangswort U302	Free	INT	0x00A6	0x0051	INT
Analog input 19 (V/mA)	169 - Analogeingangswort U303	Free	INT	0x00A7	0x0052	INT
Analog input 20 (V/mA)	170 - Analogeingangswort U304	Free	INT	0x00A8	0x0053	INT
Analog input 21 (V/mA)	171 - Analogeingangswort U305	Free	INT	0x00A9	0x0054	INT
Analog input 22 (V/mA)	172 - Analogeingangswort U306	Free	INT	0x00AA	0x0055	INT

* Unit and scaling is the parameterization refer to

14.7 AT1 Module

	Modul - GSD-File		Name	PB1	PN1	Type
PT100(0) Measurement PT1	210 - AT-1 / 1 Temperatur 1	in xxx.x °	TEMP_U101	0x00D0	0x00DC	INT
PT100(0) Measurement PT2	211 - AT-1 / 1 Temperatur 2	in xxx.x °	TEMP_U102	0x00D1	0x00DD	INT
PT100(0) Measurement PT3	212 - AT-1 / 1 Temperatur 3	in xxx.x °	TEMP_U103	0x00D2	0x00DE	INT
PT100(0) Measurement PT4	213 - AT-1 / 1 Temperatur 4	in xxx.x °	TEMP_U104	0x00D3	0x00DF	INT
PT100(0) Measurement PT5	214 - AT-1 / 1 Temperatur 5	in xxx.x °	TEMP_U105	0x00D4	0x00E0	INT
PT100(0) Measurement PT6	215 - AT-1 / 1 Temperatur 6	in xxx.x °	TEMP_U106	0x00D5	0x00E1	INT
Analog input 23 (V/mA)	216 - AT-1 / 1 Analog 1	+/- 32767 *	AN1_U107	0x00D6	0x00E2	INT
Analog input 24 (V/mA)	217 - AT-1 / 1 Analog 2	+/- 32767 *	AN2_U108	0x00D7	0x00E3	INT
	218 - AT-1 / 2 Temperatur 1	Free	TEMP_U201	0x00D8	0x00E4	INT
	219 - AT-1 / 2 Temperatur 2	Free	TEMP_U201	0x00D9	0x00E5	INT
	220 - AT-1 / 2 Temperatur 3	Free	TEMP_U201	0x00DA	0x00E6	INT
	221 - AT-1 / 2 Temperatur 4	Free	TEMP_U201	0x00DB	0x00E7	INT
	222 - AT-1 / 2 Temperatur 5	Free	TEMP_U201	0x00DC	0x00E8	INT
	223 - AT-1 / 2 Temperatur 6	Free	TEMP_U201	0x00DD	0x00E9	INT
	224 - AT-1 / 2 Analog 1	Free	AN1_U207	0x00DE	0x00EA	INT
	225 - AT-1 / 2 Analog 2	Free	AN2_U208	0x00DF	0x00EB	INT

*Unit and scaling is the parameterization refer to

Subject to technical modifications!

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