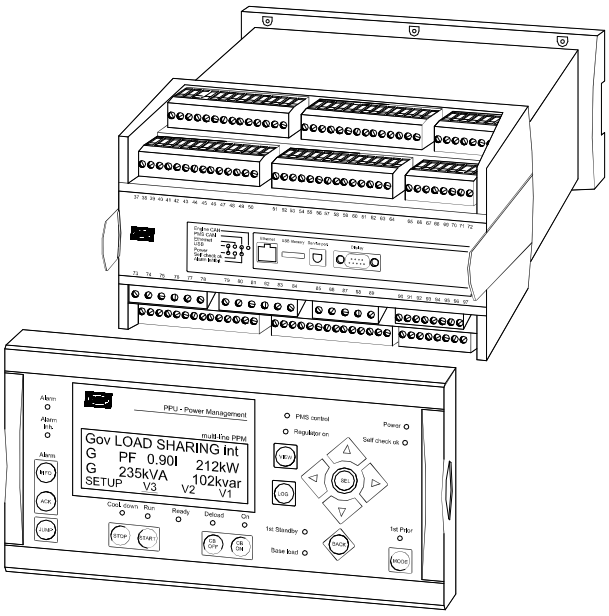
DEIF A/S

Description of options

Option H2,
RS485 Modbus communication
PPU Power Management (PPM)

4189340415D
SW version 2.5X.X



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1. Warnings and legal information

Legal information and responsibility

DEIF takes no responsibility for installation or operation of the generator set. If there is any doubt about how to install or operate the generator set controlled by the unit, the company responsible for the installation or the operation of the set must be contacted.

The units are not to be opened by unauthorised personnel. If opened anyway, the warranty will be lost.

Electrostatic discharge awareness

Sufficient care must be taken to protect the terminals against static discharges during the installation. Once the unit is installed and connected, these precautions are no longer necessary.

Safety issues

Installing the unit implies work with dangerous currents and voltages. Therefore, the installation should only be carried out by authorised personnel who understand the risks involved in working with live electrical equipment.

Be aware of the hazardous live currents and voltages. Do not touch any AC measurement inputs as this could lead to injury or death.

Definitions

Throughout this document a number of notes and warnings will be presented. To ensure that these are noticed, they will be highlighted in order to separate them from the general text.

Notes

The notes provide general information which will be helpful for the reader to bear in mind.

Warning

The warnings indicate a potentially dangerous situation which could result in death, personal injury or damaged equipment, if certain guidelines are not followed.

2. Description of option

H2 option

Option H2 is a hardware option, and therefore a separate PCB is installed in slot #2 in addition to the standard installed hardware.

Function	ANSI no.
RS485 Modbus communication	-

Terminal description

Term.	Function	Description
29	DATA + (A)	Modbus RTU, RS485
30	Not used	
31	DATA - (B)	
32	Not used	
33	DATA + (A)	
34	Not used	
35	DATA - (B)	
36	Not used	

Terminals 29 and 33 are internally connected.
Terminals 31 and 35 are internally connected

For wiring diagrams, please refer to the installation instructions.

Hardware settings

These are the PPM RS485 hardware settings:

a. 9600 or 19200 bps
b. 8 data bits
c. None parity
d. 1 stop bit

3. Parameter list

Modbus setup

7510 External communication control

No.	Setting		Min. setting	Max. setting	Factory setting
7511	Ext. comm.	ID	1	247	3
7512	Ext. comm. speed	Baud rate	9600	19200	9600
7513	Ext. comm. mode	Comm. mode	RTU	ASCII	RTU

The mode ASCII is used for modem communication (ASCII: 7 data bit. RTU: 8 data bit).

The Baud rate can be changed for the Modbus communication. (To activate the change, switch off/on the auxiliary supply).

Modbus alarm

7520 External communication error

No.	Setting		Min. setting	Max. setting	Factory setting
7521	Ext. communication error	Timer	1.0 s	100.0 s	10.0 s
7522	Ext. communication error	Relay output A	R0 (none)	Option dependent	R0 (none)
7523	Ext. communication error	Relay output B	R0 (none)		R0 (none)
7524	Ext. communication error	Enable	OFF	ON	OFF

4. Data tables

PMS measurement table (read only)

Address	Content	Type
50010	%	Base load set point
50017	P_{Avail}	Total available power [kW]
50018	P_{Cons}	Total consumed power [kW]
50034	$P_{HC1.1}$	Requested power of 1st heavy consumer in unit 1 [kW]
50035	$P_{HC1.2}$	Requested power of 2nd heavy consumer in unit 1 [kW]
50053	$P_{HC2.1}$	Requested power of 1st heavy consumer in unit 2 [kW]
50054	$P_{HC2.2}$	Requested power of 2nd heavy consumer in unit 2 [kW]
50072	$P_{HC3.1}$	Requested power of 1st heavy consumer in unit 3 [kW]
50073	$P_{HC3.2}$	Requested power of 2nd heavy consumer in unit 3 [kW]
50091	$P_{HC4.1}$	Requested power of 1st heavy consumer in unit 4 [kW]
50092	$P_{HC4.2}$	Requested power of 2nd heavy consumer in unit 4 [kW]
50110	$P_{HC5.1}$	Requested power of 1st heavy consumer in unit 5 [kW]
50111	$P_{HC5.2}$	Requested power of 2nd heavy consumer in unit 5 [kW]
50129	$P_{HC6.1}$	Requested power of 1st heavy consumer in unit 6 [kW]
50130	$P_{HC6.2}$	Requested power of 2nd heavy consumer in unit 6 [kW]
50148	$P_{HC7.1}$	Requested power of 1st heavy consumer in unit 7 [kW]
50149	$P_{HC7.2}$	Requested power of 2nd heavy consumer in unit 7 [kW]
50167	$P_{HC8.1}$	Requested power of 1st heavy consumer in unit 8 [kW]
50168	$P_{HC8.2}$	Requested power of 2nd heavy consumer in unit 8 [kW]
50205	$P_{HC10.1}$	Requested power of 1st heavy consumer in unit 10 [kW]
50206	$P_{HC10.2}$	Requested power of 2nd heavy consumer in unit 10 [kW]

Measurement table (read only) (function code 03h)

Address	Content	Type
0		Application version
1	U_{L1-L2}	Generator voltage. Measured in [V]
2	U_{L2-L3}	Generator voltage. Measured in [V]
3	U_{L3-L1}	Generator voltage. Measured in [V]
4	U_{L1-N}	Generator voltage. Measured in [V]
5	U_{L2-N}	Generator voltage. Measured in [V]
6	U_{L3-N}	Generator voltage. Measured in [V]

Address	Content	Type
7	f_{GEN}	Generator frequency. Measured in [Hz/100]
8	I_{L1}	Generator current. Measured in [A]
9	I_{L2}	Generator current. Measured in [A]
10	I_{L3}	Generator current. Measured in [A]
11	Cos-phi	-99...0...100 Generator cosinus-phi. Measured in cos-phi:100 Negative value means capacitive cos-phi
12	P_{GEN}	Generator active power. Measured in [kW]. Negative value means reverse power
13	Q_{GEN}	Generator reactive power. Measured in [kVAr]. Positive value means generated inductive reactive power
14	$U_{BBL1-L2}$	Busbar. Measured in [V]
15	f_{BB}	Busbar frequency L1. Measured in [Hz/100]
16 [HI] 17 [LO]	R_{GEN} Export	Reactive energy counter, exported reactive power. Measured in [kVArh]. Max. 300000 mVArh
18 [HI] 19 [LO]	E_{GEN} Export	Energy counter, exported power. Measured in [kWh]. Max. 300000MWh
20	Alarms	Bit 0 1000. Reverse power 1 Bit 1 1010. Reverse power 2 Bit 2 1020. Reverse power inv. Bit 3 1030. Overcurrent step 1 Bit 4 1040. Overcurrent step 2 Bit 5 1050. Overcurrent step 3 Bit 6 1060. Overcurrent step 4 Bit 7 1090. Overcurrent inverse Bit 8 Not used Bit 9 1130. Fast overcurrent 1 Bit 10 1140. Fast overcurrent 2 Bit 11 1150. U-DG High step 1 Bit 12 1160. U-DG High step 2 Bit 13 1170. U-DG Low step 1 Bit 14 1180. U-DG Low step 2 Bit 15 1190. U-DG Low step 3

Address	Content	Type	
21	Alarms	Bit 0	1210. f-DG High step 1
		Bit 1	1220. f-DG High step 2
		Bit 2	1230. f-DG High step 3
		Bit 3	1240. f-DG Low step 1
		Bit 4	1250. f-DG Low step 2
		Bit 5	1260. f-DG Low step 3
		Bit 6	1270. U-BB High step 1
		Bit 7	1280. U-BB High step 2
		Bit 8	1290. U-BB High step 3
		Bit 9	1300. U-BB Low step 1
		Bit 10	1310. U-BB Low step 2
		Bit 11	1320. U-BB Low step 3
		Bit 12	1330. U-BB Low step 4
		Bit 13	1350. f-BB High step 1
		Bit 14	1360. f-BB High step 2
		Bit 15	1370. f-BB High step 3
22	Alarms	Bit 0	1380. f-BB Low step 1
		Bit 1	1390. f-BB Low step 2
		Bit 2	1400. f-BB Low step 3
		Bit 3	1410. f-BB Low step 4
		Bit 4	Reserved
		Bit 5	Reserved
		Bit 6	Not used
		Bit 7	1450. Overload step 1
		Bit 8	1460. Overload step 2
		Bit 9	1470. Overload step 3
		Bit 10	1480. Overload step 4
		Bit 11	1490. Overload step 5
		Bit 12	1500. Unbalance current
		Bit 13	1510. Unbalance voltage
		Bit 14	1520. Q import
		Bit 15	1530. Q export
23	Alarms	Bit 0	1540. Gen. neg. sequence current
		Bit 1	1550. Gen. neg. sequence voltage
		Bit 2	Reserved
		Bit 3	Reserved

Address	Content	Type	
		Bit 4	Not used
		Bit 5	Not used
		Bit 6	Not used
		Bit 7	Not used
		Bit 8	1900 Overcurrent NEL 1
		Bit 9	1910 Overcurrent NEL 2
		Bit 10	1920 f-BB Low NEL 1
		Bit 11	1930 f-BB Low NEL 2
		Bit 12	1940 Overload step 1 NEL 1
		Bit 13	1950 Overload step 1 NEL 2
		Bit 14	1960 Overload step 2 NEL 1
		Bit 15	1970 Overload step 2 NEL 2
24	Alarms	Bit 0	3000. Dig. input term. 23
		Bit 1	3010. Dig. input term. 24
		Bit 2	3020. Dig. input term. 25
		Bit 3	3030. Dig. input term. 26
		Bit 4	3040. Dig. input term. 27
		Bit 5	3050. Dig. input term. 43
		Bit 6	3060. Dig. input term. 44
		Bit 7	3070. Dig. input term. 45
		Bit 8	3080. Dig. input term. 46
		Bit 9	3090. Dig. input term. 47
		Bit 10	3100. Dig. input term. 48
		Bit 11	3110. Dig. input term. 49
		Bit 12	3120. Dig. input term. 50
		Bit 13	3130. Dig. input term. 51
		Bit 14	3140. Dig. input term. 52
		Bit 15	3150. Dig. input term. 53
25	System alarms /status	Bit 0	2100 Sync. window
		Bit 1	2110 Sync. fail. alarm
		Bit 2	2120 Phase sequence error alarm
		Bit 3	2140 Connection breaker Close failure
		Bit 4	2150 Connection breaker Open failure
		Bit 5	2160 CB position fail. alarm
		Bit 6	2590 Governor regulator fail. alarm
		Bit 7	2610 AVR regulator fail. alarm

Address	Content	Type	
		Bit 8	4940 Battery low voltage alarm
		Bit 9	4950 Battery high voltage alarm
		Bit 10	Not used
		Bit 11	Not used
		Bit 12	Not used
		Bit 13	Not used
		Bit 14	Not used
		Bit 15	Not used
26	Alarm relay status	Bit 0	Relay 0
		Bit 1	Relay 1
		Bit 2	Relay 2
		Bit 3	Relay 3
		Bit 4	Relay 4
		Bit 5	Not used
		Bit 6	HC 1 acknowledge
		Bit 7	HC 2 acknowledge
		Bit 8	Relay 8
		Bit 9	Relay 9
		Bit 10	Not used
		Bit 11	Not used
		Bit 12	Not used
		Bit 13	Not used
		Bit 14	Relay 14
		Bit 15	Relay 15
27	Status	Bit 0	Not used
		Bit 1	Not used
		Bit 2	Not used
		Bit 3	Not used
		Bit 4	Not used
		Bit 5	Not used
		Bit 6	Not used
		Bit 7	Start sync./reg.
		Bit 8	Alarm inhibit
		Bit 9	Connection breaker position ON
		Bit 10	Synchronising
		Bit 11	Not used

Address	Content	Type	
		Bit 12	Not used
		Bit 13	Not used
		Bit 14	Not used
		Bit 15	Not used
28	Alarm relay status	Bit 0	Relay 16
		Bit 1	Relay 17
		Bit 2	Relay 18
		Bit 3	Relay 19
		Bit 4	Relay 20
		Bit 5	Not used
		Bit 6	Relay 22
		Bit 7	Relay 23
		Bit 8	Relay 24
		Bit 9	Relay 25
		Bit 10	Not used
		Bit 11	Not used
		Bit 12	Not used
		Bit 13	Not used
		Bit 14	Not used
		Bit 15	Not used
29	U_{DG-max}	Generator max. voltage. Measured in [V]	
30	U_{DG-min}	Generator min. voltage. Measured in [V]	
31	$U_{BBL2-L3}$	Busbar voltage. Measured in [V]	
32	$U_{BBL3-L1}$	Busbar voltage. Measured in [V]	
33	U_{BB-max}	Busbar max. voltage. Measured in [V]	
34	U_{BB-min}	Busbar min. voltage. Measured in [V]	
35	U_{BBL1-N}	Busbar voltage. Measured in [V]	
36	U_{BBL2-N}	Busbar voltage. Measured in [V]	
37	U_{BBL3-N}	Busbar voltage. Measured in [V]	
38	Running time	Hour	
39	RPM	RPM	
40	S_{GEN}	Generator apparent power. Measured in [kVA]	
41	VDO 1	Not available	
42	VDO 2	Not available	
43	VDO 3	Not available	

Address	Content	Type
44	$PHI_{BBL1-L2}$	0...359 busbar phase angle. Measured in [deg.]
45	$PHI_{BBL1-DGL1}$	0...359 busbar/generator phase angle. Measured in [deg.]
46	CB_{oper}	Circuit breaker operations counter
47	U_{SUPPLY}	Supply voltage. Measured in [V/10]
48	PT100 (1)	Not available
49	PT100 (2)	Not available
50	Not used	
51	Not used	
52	Not used	
53	Not used	
54	Not used	
55		Analogue input no. 1 (scaled)
56		Analogue input no. 2 (scaled)
57		Analogue input no. 3 (scaled)
58		Analogue input no. 4 (scaled)
59		Analogue input no. 5 (scaled)
60		Analogue input no. 6 (scaled)
61		Analogue input no. 7 (scaled)
62		Analogue input no. 8 (scaled)
63		No. of alarms
64		No. of unacknowledged alarms
65	Not used	
66	Not used	
67	Not used	
68	Not used	
69	Not used	
70	Alarms	Bit 0 3180. Dig. input term. 91 Bit 1 3190. Dig. input term. 92 Bit 2 3200. Dig. input term. 93 Bit 3 3210. Dig. input term. 94 Bit 4 3220. Dig. input term. 95 Bit 5 3230. Dig. input term. 96 Bit 6 3240. Dig. input term. 97 Bit 7 3250. VDO input term. 104 Bit 8 3260. VDO input term. 105

Address	Content	Type	
		Bit 9	3270. VDO input term. 106
		Bit 10	3280. Dig. input term. 110
		Bit 11	3290. Dig. input term. 111
		Bit 12	3300. Dig. input term. 112
		Bit 13	3310. Dig. input term. 113
		Bit 14	3320. Dig. input term. 114
		Bit 15	3330. Dig. input term. 115
71	Alarms	Bit 0	3340. Dig. input term. 116
		Bit 1	3350. Dig. input term. 117
		Bit 2	3360. Dig. input term. 118
		Bit 3	Not available
		Bit 4	Not available
		Bit 5	Not available
		Bit 6	Not available
		Bit 7	Not available
		Bit 8	Not available
		Bit 9	Not available
		Bit 10	Not used
		Bit 11	Not used
		Bit 12	Not used
		Bit 13	Not used
		Bit 14	Not used
		Bit 15	Not used
72	Alarms	Bit 0	4000. 4-20mA input no. 91.1
		Bit 1	4010. 4-20mA input no. 91.2
		Bit 2	4020. Wire break failure 91
		Bit 3	4030. 4-20mA input no. 93.1
		Bit 4	4040. 4-20mA input no. 93.2
		Bit 5	4050. Wire break failure 93
		Bit 6	4060. 4-20mA input no. 95.1
		Bit 7	4070. 4-20mA input no. 95.2
		Bit 8	4080. Wire break failure 95
		Bit 9	4090. 4-20mA input no. 97.1
		Bit 10	4100. 4-20mA input no. 97.2
		Bit 11	4110. Wire break failure 97
		Bit 12	4120. 4-20mA input no. 98.1

Address	Content	Type	
		Bit 13	4130. 4-20mA input no. 98.2
		Bit 14	4140. Wire break failure 98
		Bit 15	4150. 4-20mA input no. 100.1
73	Alarms	Bit 0	4160. 4-20mA input no. 100.2
		Bit 1	4170. Wire break failure 100
		Bit 2	4180. 4-20mA input no. 102.1
		Bit 3	4190. 4-20mA input no. 102.2
		Bit 4	4200. Wire break failure 102
		Bit 5	Not available
		Bit 6	Not available
		Bit 7	Not available
		Bit 8	Not used
		Bit 9	Not used
		Bit 10	Not used
		Bit 11	Not used
		Bit 12	Not used
		Bit 13	Not used
		Bit 14	Not used
		Bit 15	Not used
78	Alarms	Bit 0	Not available
		Bit 1	Not available
		Bit 2	Not used
		Bit 3	Not available
		Bit 4	Not available
		Bit 5	Not used
		Bit 6	4750. Overspeed 1
		Bit 7	4760. Overspeed 2
		Bit 8	Not used
		Bit 9	Not used
		Bit 10	Not used
		Bit 11	Not used
		Bit 12	Not used
		Bit 13	Not used
		Bit 14	Not used
		Bit 15	Not used
79	Alarms	Bit 0	4420. VDO input 104.1

Address	Content	Type	
		Bit 1	4430. VDO input 104.2
		Bit 2	4480. Wire break failure 104
		Bit 3	4570. VDO input 105.1
		Bit 4	4580. VDO input 105.2
		Bit 5	4610. Wire break failure 105
		Bit 6	4720. VDO input 106.1
		Bit 7	4730. VDO input 106.2
		Bit 8	4740. Wire break failure 106
		Bit 9	Not used
		Bit 10	Not used
		Bit 11	Not used
		Bit 12	Not used
		Bit 13	Not used
		Bit 14	Not used
		Bit 15	Not used
80	P_{Avail}	Total available power. Measured in [kW]	
81	P_{Cons}	Total consumed power. Measured in [kW]	
106	Status	Bit 0	PMS control
		Bit 1	DG ready
		Bit 2	DG running
		Bit 3	Connection breaker position ON
		Bit 4	Synchronising
		Bit 5	Ramp down
		Bit 6	Voltage/frequency OK
		Bit 7	Not used
		Bit 8	Base load
		Bit 9	Not used
		Bit 10	Not used
		Bit 11	Not used
		Bit 12	Not used
		Bit 13	Not used
		Bit 14	Not used
		Bit 15	Not used
107	Alarms	Bit 0	Fail class WARNING
		Bit 1	Fail class PREWARNING / SAFETY STOP
		Bit 2	Fail class BLOCK

Address	Content	Type	
		Bit 3	Fail class CB TRIP
		Bit 4	Fail class CB TRIP AND STOP
		Bit 5	Fail class SHUTDOWN
		Bit 6	Fail class SHORT CIRCUIT
		Bit 7	Fail class SYSTEM ALARM
		Bit 8	Not used
		Bit 9	Not used
		Bit 10	Not used
		Bit 11	Not used
		Bit 12	Not used
		Bit 13	Not used
		Bit 14	Not used
		Bit 15	Not used

PMS status register table (read only) (function code 03h)

Address	Content	Description
50000	Plant mode	0, means that the plant mode is in Semi-Auto mode 1, means that the plant mode is in Auto mode 2, means that the plant mode is in Shaft/Shore mode 3, means that the plant mode is in Split mode
50013	Base load ON	The base load function is active

Control register table (write only) (function code 10h)

Address	Content	Description
4370	Priority transmit	Transmit the selected priority to the master unit
4371	1st priority	Select the 1st priority
4372	2nd priority	Select the 2nd priority
4373	3rd priority	Select the 3rd priority
4374	4th priority	Select the 4th priority
4375	5th priority	Select the 5th priority
4376	6th priority	Select the 6th priority
4377	7th priority	Select the 7th priority
4378	8th priority	Select the 8th priority
Date and time setting		
19000	Year setting	2003...2099
19001	Month setting	1...12
19002	Date setting	1...31
19003	Day setting	1...7 (1 = Monday, 7 = Sunday)
19004	Hour setting	0...23
19005	Second setting	0...59

PMS command register table (write only) (function code 10h)

Address	Content	Description
52200	Semi-Auto	Set the plant mode to Semi-Auto
52201	Auto	Set the plant mode to Auto
52202	Shaft	Set the plant mode to Shaft
52203	Split	Set the plant mode to Split
52204	Base load ON	Activates the base load function
52205	Base load OFF	Deactivates the base load function
52206	Secured ON	Activates the secured function
52207	Secured OFF	Deactivates the secured function

Command flags table (write only) (function code 0Fh)

Address	Content	Description
0		Not used
1		Not used
2		Not used
3		Not used
4		Not used
5		Not used
6		Not used
7		Not used
8		Not used
9	Alarm ackn.	Acknowledgement of all alarms
10		Not used
11		Not used
12		Not used
13	Start	Semi-Auto start command
14	CB ON	Semi-Auto connection breaker ON command
15	CB OFF	Semi-Auto connection breaker OFF command
16	Stop	Semi-Auto stop command

PMS status flags table (read only) (function code 01h)

Address	Content	Description
50018	Secured ON	The secured function is active
50069	HC 1.1 connected	Deactivates the base load function
50070	HC 1.2 connected	The 2nd heavy consumer from unit 1 is connected
50109	HC 2.1 connected	The 1st heavy consumer from unit 2 is connected
50110	HC 2.2 connected	The 2nd heavy consumer from unit 2 is connected
50149	HC 3.1 connected	The 1st heavy consumer from unit 3 is connected
50150	HC 3.2 connected	The 2nd heavy consumer from unit 3 is connected
50189	HC 4.1 connected	The 1st heavy consumer from unit 4 is connected
50190	HC 4.2 connected	The 2nd heavy consumer from unit 4 is connected
50229	HC 5.1 connected	The 1st heavy consumer from unit 5 is connected
50230	HC 5.2 connected	The 2nd heavy consumer from unit 5 is connected
50269	HC 6.1 connected	The 1st heavy consumer from unit 6 is connected
50270	HC 6.2 connected	The 2nd heavy consumer from unit 6 is connected
50309	HC 7.1 connected	The 1st heavy consumer from unit 7 is connected
50310	HC 7.2 connected	The 2nd heavy consumer from unit 7 is connected
50349	HC 8.1 connected	The 1st heavy consumer from unit 8 is connected
50350	HC 8.2 connected	The 2nd heavy consumer from unit 8 is connected
50429	HC 10.1 connected	The 1st heavy consumer from unit 10 is connected
50430	HC 10.2 connected	The 2nd heavy consumer from unit 10 is connected

5. Parameter table

Parameter table reading and writing

The entire setting of parameters can be made using the Modbus. The combination of function and address areas used is described below.

Function 01(01hex) read flag status

Reads the ON/OFF status of discrete flags in the slave unit.

Address area for reading of status flags

Multi-line 2 Data to request	Multi-line 2 Table	Address area
Status	Status table	0-499
Alarm active	Parameter table	1000-1999
Alarm acknowledge	Parameter table	2000-2999
Digital input	Digital input table	3000-3999
Digital output	Digital output table	4000-4999

The maximum number of data query is limited by the length of the actual table.

Function 03(03hex) read registers

Reads the binary of registers in the slave unit.

Address area for reading of registers

Multi-line 2 Data to request	Multi-line 2 Table	Address area
Measuring values	Measuring values table	0-499
Timers used	Parameter table	1000-1999
Timers minimum	Parameter table	2000-2999
Timers maximum	Parameter table	3000-3999
Values used	Parameter table	4000-4999
Values minimum	Parameter table	5000-5999
Values maximum	Parameter table	6000-6999

The maximum number of data query is limited by the length of the actual table.

Function 15(0Fhex) write multiple flags

Writes each flag (0 x reference) in a sequence of flags to either ON or OFF.

Address area for writing of status flags

Multi-line 2 Data to request	Multi-line 2 Table	Address area
Commands	Command table	0-499
Alarm acknowledge	Parameter table	2000-2999

The maximum number of data query is limited by the length of the actual table.

Function 16(10hex) write register

Writes values into a sequence of registers.

Address area for writing of registers

Multi-line 2 Data to request	Multi-line 2 Table	Address area
Timers used	Parameter table	1000-1999
Values used	Parameter table	4000-4999

The maximum number of data query is limited of the length of the actual table.

Parameter table

Address and channel number overview

Offset address	Ch. no.	Content	Value unit	Delay unit
1	1000	Reverse power 1	%/10	1/10s
2	1010	Reverse power 2	%/10	1/10s
3	1020	Reverse power inverse	%/10	1/10s
4	1030	Overcurrent 1	%/10	1/10s
5	1040	Overcurrent 2	%/10	1/10s
6	1050	Overcurrent 3	%/10	1/10s
7	1060	Overcurrent 4	%/10	1/10s
8	1071	Overcurrent inverse 1 value	%/10	1/10s
9	1073	Overcurrent inverse 2 values	%/10	1/10s
10	1075	Overcurrent inverse 3 values	%/10	1/10s
11	1081	Overcurrent inverse 4 values	%/10	1/10s
12	1083	Overcurrent inverse 5 values	%/10	1/10s
13	1085	Overcurrent inverse 6 values	%/10	1/10s
14	1090	Overcurrent inv. relays and enable	None	None
15	1130	Fast overcurrent 1	%/10	1/10s
16	1140	Fast overcurrent 2	%/10	1/10s
17	1150	Gen high-volt 1	%/10	1/10s
18	1160	Gen high-volt 2	%/10	1/10s
19	1170	Gen low-volt 1	%/10	1/10s
20	1180	Gen low-volt 2	%/10	1/10s
21	1190	Gen low-volt 3	%/10	1/10s
22	1200	Gen volt. trip	None	None
23	1210	Gen high-freq 1	%/10	1/10s
24	1220	Gen high-freq 2	%/10	1/10s
25	1230	Gen high-freq 3	%/10	1/10s
26	1240	Gen low-freq 1	%/10	1/10s
27	1250	Gen low-freq 2	%/10	1/10s
28	1260	Gen low-freq 3	%/10	1/10s
29	1270	Bus high-volt 1	%/10	1/100s
30	1280	Bus high-volt 2	%/10	1/100s
31	1290	Bus high-volt 3	%/10	1/100s
32	1300	Bus low-volt 1	%/10	1/100s

Offset address	Ch. no.	Content	Value unit	Delay unit
33	1310	Bus low-volt 2	%/10	1/100s
34	1320	Bus low-volt 3	%/10	1/100s
35	1330	Bus low-volt 4	%/10	1/100s
36	1340	Bus volt. trip	None	None
37	1350	Bus high-freq 1	%/10	1/100s
38	1360	Bus high-freq 2	%/10	1/100s
39	1370	Bus high-freq 3	%/10	1/100s
40	1380	Bus low-freq 1	%/10	1/100s
41	1390	Bus low-freq 2	%/10	1/100s
42	1400	Bus low-freq 3	%/10	1/100s
43	1410	Bus low-freq 4	%/10	1/100s
44	1420	Reserved		
45	1430	Reserved		
46	1440	Reserved		
47	1450	Overload 1	%/10	1/10s
48	1460	Overload 2	%/10	1/10s
49	1470	Overload 3	%/10	1/10s
50	1480	Overload 4	%/10	1/10s
51	1490	Overload 5	%/10	1/10s
52	1500	Unbalance curr.	%/10	1/10s
53	1510	Unbalance volt.	%/10	1/10s
54	1520	VAr import	%/10	1/10s
55	1530	VAr export	%/10	1/10s
56 - 61		Reserved		
62	1900	NEL 1 I>	%/10	1/10s
63	1910	NEL 2 I>	%/10	1/10s
64	1920	NEL 1 BUS f<	%/10	1/10s
65	1930	NEL 2 BUS f<	%/10	1/10s
66	1940	NEL 1 P>	%/10	1/10s
67	1950	NEL 2 P>	%/10	1/10s
68	1960	NEL 1 P>>	%/10	1/10s
69	1970	NEL 2 P>>	%/10	1/10s
70	2000	Static sync. (enable/disable only)	None	None
71	2021	Sync. df max.	Hz/10	None
72	2022	Sync. df min.	Hz/10	None

Offset address	Ch. no.	Content	Value unit	Delay unit
73	2023	Sync. dU max.	%	None
74	2024	Sync. t CB	ms	None
75	2031	Static sync. df max.	Hz/10	None
76	2032	Static sync. dU max.	%	None
77	2033	Static close window	Deg.	None
78	2051	Static phase controller Kp	None	None
79	2052	Static phase controller Ki	None	None
80		Reserved		
81	2091	Blackout df max.	Hz/10	None
82	2092	Blackout dU max.	%	None
83		Reserved		
84	2100	Sync. window	%	1/10s
85	2110	Sync. failure	None	1/10s
86	2120	Phase seq. fail	None	None
87	2140	Open failure	None	1/10s
88	2150	Close failure	None	1/10s
89	2160	Position fail.	None	1/10s
90		Reserved		
91	2511	Freq. control DB	%/10	None
92	2512	Freq. control Kp	None	None
93	2513	Freq. control Ki	None	None
94		Reserved		
95	2521	Power control DB	%/10	None
96	2522	Power control Kp	None	None
97	2523	Power control Ki	None	None
98		Reserved		
99		Reserved		
100	2541	Power ramp down speed	%/10/s	None
101	2542	Power ramp down point	%	None
102 - 108		Reserved		
109	2590	Governor regulator failure	%/10	1/10s
110		Reserved		
111	2610	AVR regulator fail.	%/10	1/10s
112	2621	GOV min. ON time	ms	None
113	2622	GOV period time	ms	None

Offset address	Ch. no.	Content	Value unit	Delay unit
114	2631	AVR min. ON time	ms	None
115	2632	AVR period time	ms	None
116 - 125		Reserved		
126	3000	Dig. input term. 23	None	1/10s
127	3010	Dig. input term. 24	None	1/10s
128	3020	Dig. input term. 25	None	1/10s
129	3030	Dig. input term. 26	None	1/10s
130		Reserved		
131	3050	Dig. input term. 43	None	1/10s
132	3060	Dig. input term. 44	None	1/10s
133	3070	Dig. input term. 45	None	1/10s
134	3080	Dig. input term. 46	None	1/10s
135	3090	Dig. input term. 47	None	1/10s
136	3100	Dig. input term. 48	None	1/10s
137	3110	Dig. input term. 49	None	1/10s
138	3120	Dig. input term. 50	None	1/10s
139	3130	Dig. input term. 51	None	1/10s
140	3140	Dig. input term. 52	None	1/10s
141	3150	Dig. input term. 53	None	1/10s
142 - 148		Reserved		
149	3250	VDO input term. 104	None	1/10s
150	3260	VDO input term. 105	None	1/10s
151	3270	VDO input term. 106	None	1/10s
152	3280	Dig. input term. 110	None	1/10s
153	3290	Dig. input term. 111	None	1/10s
154	3300	Dig. input term. 112	None	1/10s
155	3310	Dig. input term. 113	None	1/10s
156	3320	Dig. input term. 114	None	1/10s
157	3330	Dig. input term. 115	None	1/10s
158	3340	Dig. input term. 116	None	1/10s
159	3350	Dig. input term. 117	None	1/10s
160	3360	Dig. input term. 118	None	1/10s
161 - 167		Reserved		
168	4120	4-20mA in no. 98.1 (alarm setting)	Select	1/10s
169	4150	4-20mA in no. 100.1 (alarm setting)	Select	1/10s

Offset address	Ch. no.	Content	Value unit	Delay unit
170	4180	4-20mA in no. 102.1 (alarm setting)	Select	1/10s
171 - 175		Reserved		
176	4130	4-20mA in no. 98.2 (alarm setting)	Select	1/10s
177	4160	4-20mA in no. 100.2 (alarm setting)	Select	1/10s
178	4190	4-20mA in no. 102.2 (alarm setting)	Select	1/10s
179 - 187		Reserved		
188	4750	Overspeed 1 (Tacho)	rpm	1/10s
189	4760	Overspeed 2 (Tacho)	rpm	1/10s
190 - 199		Reserved		
200	4140	Wire failure no. 98	None	1/10s
201	4170	Wire failure no. 100	None	1/10s
202	4200	Wire failure no. 102	None	1/10s
203 - 208		Reserved		
209	4480	Wire failure no. 104	None	1/10s
210		Reserved		
211	4610	Wire failure no. 105	None	1/10s
212		Reserved		
213	4740	Wire failure no. 106	None	1/10s
214	4940	Battery low volt.	V	1/10s
215	4950	Battery high volt.	V	1/10s
216	5000	Relay 0 virtual	None	1/10s
217	5010	Relay 1	None	1/10s
218	5020	Relay 2	None	1/10s
219		Reserved		
220	5040	Relay 4	None	1/10s
221		Reserved		
222	5060	Relay 6	None	1/10s
223	5070	Relay 7	None	1/10s
224	5080	Relay 8	None	1/10s
225	5090	Relay 9	None	1/10s
226		Reserved		
227		Reserved		
228		Reserved		
229		Reserved		
230	5140	Relay 14	None	1/10s

Offset address	Ch. no.	Content	Value unit	Delay unit
231	5150	Relay 15	None	1/10s
232	5160	Relay 16	None	1/10s
233	5170	Relay 17	None	1/10s
234 - 268		Reserved		
269	6001	Nom. frequency	Hz/10	None
270	6002	Nom. power	kW	None
271	6003	Nom. current	A	None
272	6004	Nom. voltage	V	None
273	6021	Volt prim. GEN	V	None
274	6022	Volt sec. GEN	V	None
275	6023	Current prim.	A	None
276	6024	Current sec.	A	None
277	6031	Volt prim. BUS	V	None
278	6032	Volt sec. BUS	V	None
279	6060	Language	None	None
280	6081	Running time	n0	None
281	6082	Circuit breaker operations	n0	None
282	6083	Reset kWh counter	n0	None
283 - 285		Reserved		
286	6130	Run status	-	
287	6141	Running RPM	RPM	None
288	6142	No. of teeth (flywheel)	n0	None
289	6143	Tacho failure	None	None
290	6151	Start prepare	None	1/10s
291	6152	Start ON time (crank)	None	1/10s
292	6153	Start OFF time (pause)	None	1/10s
293	6160	Start attempts	n0	None
294	6170	f/U OK	None	1/10s
295	6180	f/U failure	None	1/10s
296	6191	Cooldown time	None	1/10s
297	6192	Extended stop time (stop coil)	None	1/10s
298	6193	Coil type	None	None
299	6200	Stop failure	None	1/10s
300 - 303		Reserved		
304	6340	Load share out	1/10V	None

Offset address	Ch. no.	Content	Value unit	Delay unit
305	6350	Load sharing type	None	None
306 - 312		Reserved		
313	7511	Ext. comm.	-	None
314	7512	Ext. comm. speed	None	None
315	7513	Ext. comm. mode	None	None
316	7520	Ext. comm. error	None	1/10s
317	7530	Internal comm. ID	-	None
318		Reserved		
319	7541	Enable ID 1	None	None
320	7542	Enable ID 2	None	None
321	7543	Enable ID 3	None	None
322	7544	Enable ID 4	None	None
323	7545	Enable ID 5	None	None
324	7551	Enable ID 6	None	None
325	7552	Enable ID 7	None	None
326	7553	Enable ID 8	None	None
327	7554	Enable ID 9	None	None
328	7555	Enable ID 10	None	None
329 - 339		Reserved		
340	8001	Number of DGs	-	None
341 - 345		Reserved		
346	8011	Select kW(0) / kVA(1)	n0	None
347	8012	Select value(0) / %(1)	n0	None
348 - 351		Reserved		
352	8021	Start limit P	kW	None
353	8022	Start limit S	kVA	None
354	8023	Start limit %	%	None
355	8024	Load dependent start delay	None	1/10s
356 - 357		Reserved		
358	8031	Stop limit P	kW	None
359	8032	Stop limit S	kVA	None
360	8033	Stop limit %	%	None
361	8034	Load dependent stop delay	None	1/10s
362	8035	Load dependent stop block	n0	None
363		Reserved		

Offset address	Ch. no.	Content	Value unit	Delay unit
364	8041	Select DG amount		None
365	8042	Select plant mode	n0	None
366	8043	Select start attempts	n0	None
367 - 369		Reserved		
370	8051	Transmit (1)	n0	None
371	8052	1st prior DGno.	y	None
372	8053	2nd prior DGno.	y	None
373	8054	3rd prior DGno.	y	None
374	8055	4th prior DGno.	y	None
375	8056	5th prior DGno.	y	None
376	8061	6th prior DGno.	y	None
377	8062	7th prior DGno.	y	None
378	8063	8th prior DGno.	y	None
379 - 381		Reserved		
382	8071	Base ld. ON/OFF	n0	None
383	8072	Base load value	%	None
384	8073	Cancel delay	None	1/10s
385 - 387		Reserved		
388	8081	PROG1 pulse time	None	1/10s
389	8082	PROG2 pulse time	None	1/10s
390 - 393		Reserved		
394	8091	Select ON/OFF	n0	None
395	8092	Select interval	H	None
396 - 399		Reserved		
400	8201	HC1 max. power	kW	None
401	8202	HC1 load type	None	None
402	8203	HC1 ack. type	None	None
403	8211	HC2 max. power	kW	None
404	8212	HC2 load type	None	None
405	8213	HC2 ack. type	None	None
406 - 500		Reserved		
501	9116	Customer password	None	None
502	9117	Service password	None	None
503	9118	Master password	None	None

Please refer to the Designer's Reference Handbook for information about:

- **Availability of channels**
- **Min./max. settings**
- **Factory settings**

Note that several channels also depend on the options.

Limitations

It is possible to write to channels, where the option is not activated. It is not possible to enable the channel. E.g. if an attempt is made to write a '1' to the enable flag, then the '1' will be discarded, and the enable flag remains '0'. It is not possible to write to offset address 0. These values are used for DEIF internal version control.

Abbreviations

These abbreviations are used in the tables:

- 'y' means that the channel is writeable.
- 'n' means that a '0' can be written to the channel only.
- 'n10' means that only the value 10 can be written.

Examples

Write nominal frequency (6011), offset 258, 60Hz

ID = 1, 60Hz = 600Hz/10 = 0258h
Address 4000 + 258 = 4258d = 10A2h
Tx: 01h 10h 10h A2h 00h 01h 02h 02h 58h AEh 49h
Rx: 01h 10h 10h A2h 00h 01h A4h EBh

Read nominal frequency (6011) offset 258, 60Hz

Tx: 01h 03h 10h A2h 00h 01h 21h 28h
Rx: 01h 03h 02h 02h 58h B8h DEh
Read 0258h = 600d

Digital input table (read only 01h)

Address	Terminal	Description
3001 - 3007		Not available
3008	91	Dig. input term. 91 (option M16)
3009	92	Dig. input term. 92 (option M16)
3010	93	Dig. input term. 93 (option M16)
3011	94	Dig. input term. 94 (option M16)
3012	95	Dig. input term. 95 (option M16)
3013	96	Dig. input term. 96 (option M16)
3014	97	Dig. input term. 97 (option M16)
3015 - 3028		Not available
3029	43	Dig. input term. 43
3030	44	Dig. input term. 44
3031	45	Dig. input term. 45
3032	46	Dig. input term. 46
3033	47	Dig. input term. 47
3034	48	Dig. input term. 48
3035	49	Dig. input term. 49
3036	50	Dig. input term. 50
3037	51	Dig. input term. 51
3038	52	Dig. input term. 52
3039	53	Dig. input term. 53
3040	54	Breaker position off
3041	55	Breaker position on
3042	23	Dig. input term. 23
3043	24	Dig. input term. 24
3044	25	Dig. input term. 25
3045	26	Dig. input term. 26
3046	27	PMS/SWBD control
3047 - 3074		Not available
3075	110	Dig. input term. 110
3076	111	Dig. input term. 111
3077	112	Dig. input term. 112
3078	113	Dig. input term. 113
3079	114	Dig. input term. 114
3080	115	Ready for operation
3081	116	Running

3082	117	Remote start
3083	118	Remote stop

Digital output table (read only 01h)

Address	Terminal	Description
4000	65/66	Governor up
4001	67/68	Governor down
4002	69/70	Relay 12/AVR up
4003	71/72	Relay 13/AVR down
4004	132/133	Not available
4005	130/131	Not available
4006	128/129	Not available
4007	126/127	Not available
4008	96/97	Relay 17 (option M18)
4009	94/95	Relay 16 (option M18)
4010	92/93	Relay 15 (option M18)
4011	90/91	Relay 14 (option M18)
4012 - 4015		Not available
4016	57/58	Relay 6
4017	59/60	Relay 7
4018	61/62	Relay 8
4019	63/64	Relay 9
4020-4024		Not available
4025	5/6/7	Relay 1
4026	8/9/10	Relay 2
4027	11/12/13	PMS alarm
4028	14/15/16	Open breaker
4029	17/18/19	Close breaker (sync.)
4030	20	Relay 26 (transistor output)
4031	21	Relay 27 (transistor output)
4032 - 4043		Not available
4044	120/121	Relay 18/Start (engine)
4045	122/123	Relay 19/Stop (engine)
4046	124/125	Relay 20/Start prepare (engine)