MULTI-LINE 2
DESCRIPTION OF OPTIONS

Option H2
Modbus communication

- Description of option
- Data tables
- Parameter tables

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This description of options covers the following products:

AGC	SW version 3.4X.X or later
PPM	SW version 3.0X.X or later

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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

ANSI numbers

Function	ANSI no.
RS485 Modbus communication	-

H2 option

Terminal description

Option H2 is a hardware option, and therefore a separate PCB is installed in slot #2 in addition to the standard-installed hardware. These terminal positions are used in all products mentioned in this document.

Term.	Function	Description
29	DATA + (A)	Modbus RTU, RS485
30	GND	
31	DATA - (B)	
32		
33	DATA + (A)	
34		
35	DATA - (B)	
36		

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

Hardware settings

These are the RS485 hardware settings:

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

Wiring

Regarding wiring, please refer to the “Installation Instructions”.

3. Parameters

This option has the following related settings: 7500-7520.

Please refer to the separate parameter list for details.

AGC document number: 4189340563.
PPM document number: 4189340561.

4. Data tables

Configurable area (read only) (function code 04h)

Columns:

- **'X' means standard feature.**
- **Empty field means not available.**
- **Letter/number combination refers to an option number.**
- **Number alone refers to a terminal.**

Analogue values

Address		Content		AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
0		U_{L1-L2}	Generator voltage L1-L2 [V]	X		X	X	X	X		
		U_{L1-L2}	Mains voltage L1-L2 [V]		X						
		U_{L1-L2}	Bus A voltage L1-L2 [V]								X
		U_{L1-L2}	Shore voltage L1-L2 [V]							X	
1		U_{L2-L3}	Generator voltage L2-L3 [V]	X		X	X	X	X		
		U_{L2-L3}	Mains voltage L2-L3 [V]		X						
		U_{L2-L3}	Bus A voltage L2-L3 [V]								X
		U_{L2-L3}	Shore voltage L2-L3 [V]							X	
2		U_{L3-L1}	Generator voltage L3-L1 [V]	X		X	X	X	X		

Address		Content		AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
		U_{L3-L1}	Mains voltage L3-L1 [V]		X						
		U_{L3-L1}	Bus A voltage L3-L1 [V]								X
		U_{L3-L1}	Shore voltage L3-L1 [V]							X	
3		U_{L1-N}	Generator voltage L1-N [V]	X		X	X	X	X		
		U_{L1-N}	Mains voltage L1-N [V]		X						
		U_{L1-N}	Bus A voltage L1-N [V]								X
		U_{L1-N}	Shore voltage L1-N [V]							X	
4		U_{L2-N}	Generator voltage L2-N [V]	X		X	X	X	X		
		U_{L2-N}	Mains voltage L2-N [V]		X						
		U_{L2-N}	Bus A voltage L2-N [V]								X
		U_{L2-N}	Shore voltage L2-N [V]							X	
5		U_{L3-N}	Generator voltage L3-N [V]	X		X	X	X	X		
		U_{L3-N}	Mains voltage L3-N [V]		X						
		U_{L3-N}	Bus A voltage L3-N [V]								X
		U_{L3-N}	Shore voltage L3-N [V]							X	
6		f_{L1}	Generator f L1 [Hz/100]	X		X	X	X	X		
		f_{L1}	Mains f L1 [Hz/100]		X						
		f_{L1}	Bus A f L1 [Hz/100]								X
		f_{L1}	Shore f L1 [Hz/100]							X	
7		I_{L1}	Generator current L1 [A]	X		X	X	X	X		

Address		Content		AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
		I_{L1}	Mains current L1 [A]		X						
		I_{L1}	Bus current L1 [A]								X
		I_{L1}	Shore current L1 [A]							X	
8		I_{L2}	Generator current L2 [A]	X		X	X	X	X		
		I_{L2}	Mains current L2 [A]		X						
		I_{L2}	Bus current L2 [A]								X
		I_{L2}	Shore current L2 [A]							X	
9		I_{L3}	Generator current L3 [A]	X		X	X	X	X		
		I_{L3}	Mains current L3 [A]		X						
		I_{L3}	Bus current L3 [A]								X
		I_{L3}	Shore current L3 [A]							X	
10		P_{GEN}	Generator power [kW]	X		X	X	X	X		
		P_{MAINS}	Mains power [kW]		X						
		P_{BA}	Bus power [kW]								X
		P_{SC}	Shore power [kW]							X	
11		Q_{GEN}	Generator reactive power [kVAr]	X		X	X	X	X		
		Q_{MAINS}	Mains reactive power [kVAr]		X						
		Q_{BA}	Bus reactive power [kVAr]								X
		Q_{SC}	Shore reactive power [kVAr]							X	
12		S_{GEN}	Generator apparent power [kVA]	X		X	X	X	X		
		S_{MAINS}	Mains apparent power [kVA]		X						
		S_{BA}	Bus apparent power [kVA]								X

Address		Content		AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
		S_{SC}	Shore apparent power [kVA]							X	
13		Cos-phi	Generator PF [cosPhi/100]	X		X	X	X	X		
		Cos-phi	Mains PF [cosPhi/100]		X						
		Cos-phi	Bus PF [cosPhi/100]								X
		Cos-phi	Shore PF [cosPhi/100]							X	
14	[Hi]	R_{GEN}	Reactive energy counter [kVArh]	X	X	X	X	X	X	X	X
15	[Lo]										
16	[Hi]	E_{GEN}	Active energy counter [kWh]	X	X	X	X	X	X	X	X
17	[Lo]										
18		$U_{BBL1-L2}$	U BB L1-L2 [V]	X	X	X	X	X	X	X	
		$U_{BBL1-L2}$	U BB B L1-L2 [V]								X
19		$U_{BBL2-L3}$	U BB L2-L3 [V]	X	X	X	X	X	X	X	
		$U_{BBL2-L3}$	U BB B L2-L3 [V]								X
20		$U_{BBL3-L1}$	U BB L3-L1 [V]	X	X	X	X	X	X	X	
		$U_{BBL3-L1}$	U BB B L3-L1 [V]								X
21		U_{BBL1-N}	U BB L1-N [V]	X	X	X	X	X	X	X	
		U_{BBL1-N}	U BB B L1-N [V]								X
22		U_{BBL2-N}	U BB L2-N [V]	X	X	X	X	X	X	X	
		U_{BBL2-N}	U BB B L2-N [V]								X
23		U_{BBL3-N}	U BB L3-N [V]	X	X	X	X	X	X	X	
		U_{BBL3-N}	U BB B L3-N [V]								X
24		F_{BB}	BB f L1 [Hz/100]	X	X	X	X	X	X	X	

Address		Content		AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
			BB B f L1 [Hz/100]								X
25		$PHI_{BBL1-L2}$	U BB phase angle L1-L2 [Deg/10]	X	X	X	X	X	X	X	X
26		$PHI_{BBL1-DGL1}$	U BB L1 - U GEN L1 phase angle [Deg/10]	X		X	X	X	X	X	
		$PHI_{BBL1-ML1}$	U BB L1 - U Mains L1 phase angle [Deg/10]		X						
		$PHI_{BAL1-BBL1}$	U BB A L1 - U BB 2 L1 phase angle [Deg/10]								X
27		Alarms	No. of alarms	X	X	X	X	X	X	X	X
28		Alarms	No. of unack. alarms	X	X	X	X	X	X	X	X
29		Start attempts	Start attempts	X			X	X			
30	[Hi]	Abs. run. hours	Abs. run hours	X			X	X	X		
31	[Lo]										
32		GB_{oper}	No. of GB operations	X		X	X	X	X		
		TB_{oper}	No. of TB operations		X	X					
		BTB_{oper}	No. of BTB operations								X
		SCB_{oper}	No. of SCB operations							X	
33		MB_{oper}	No. of MB operations	X	X						
		TB_{oper}	No. of TB operations					X			
34		U_{SUPPLY}	DC supply term. 1-2 [V/10]	X	X	X	X	X	X	X	X
35		$U_{SUPPLY\ M4}$	DC supply term. 98-99 [V/10]	X	X	X	X	X	X	X	X
36		RPM	RPM	X		X	X	X	X		

Address			Content	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
37			Multi-input 102 unscaled	X	X	X	X	X	X	X	X
38			Multi-input 105 unscaled	X	X	X	X	X	X	X	X
39			Multi-input 108 unscaled	X	X	X	X	X	X	X	X
40			Control register address 0	X	X	X	X	X	X	X	X
41			Control register address 1	X	X	X	X	X	X	X	X
42			Control register address 2	X	X	X	X	X	X	X	X
43			Control register address 3	X	X	X	X	X	X	X	X
44			Control register address 4	X	X	X	X	X	X	X	X
45			Control register address 5	X	X	X	X	X	X	X	X
46			Control register address 6	X	X	X	X	X	X	X	X
47			Control register address 7	X	X	X	X	X	X	X	X

Alarms

Address	Bit	Parameter	Content	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
48	**Generator/mains/busbar 1/shore connection**										
	0	1000	G -P> 1	X			X	X	X		
			M -P> 1		X						
			BTB -P> 1			X					X
			SC -P> 1							X	
	1	1010	G –P> 2	X			X	X	X		
			M -P> 2		X						
			BTB -P> 2			X					X
			SC -P> 2							X	
	2	1020	Reserved								
	3	1030	G I> 1	X			X	X	X		
			M I> 1		X						
			BTB I> 1			X					X
			SC I> 1							X	
	4	1040	G I> 2	X			X	X	X		
			M I> 2		X						
			BTB I> 2			X					X
			SC I> 2							X	
	5	1050	G I> 3	X			X	X	X		

Address	Bit	Parameter	Content	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
			M I> 3		X						
			BTB I> 3			X					X
			SC I> 3							X	
	6	1060	G I> 4	X			X	X	X		
			M I> 4		X						
			BTB I> 4			X					X
			SC I> 4							X	
	7	1090	Reserved								
	8	1120	Reserved								
	9	1130	G I>> 1	X			X	X	X		
			M I>> 1		X						
			BTB I>> 1			X					X
			SC I>> 1							X	
	10	1140	G I>> 2	X			X	X	X		
			M I>> 2		X						
			BTB I>> 2			X					X
			SC I>> 2							X	
	11	1150	G U> 1	X			X	X	X		
			M U> 1		X						
			BB-A U> 1			X					X
			SC U> 1							X	

Address	Bit	Parameter	Content	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
	12	1160	G U> 2	X			X	X	X		
			M U> 2		X						
			BB-A U> 2			X					X
			SC U> 2							X	
	13	1170	G U< 1	X			X	X	X		
			M U< 1		X						
			BB-A U< 1			X					X
			SC U< 1							X	
	14	1180	G U< 2	X			X	X	X		
			M U< 2		X						
			BB-A U< 2			X					X
			SC U< 2							X	
	15	1190	G U< 3	X			X	X	X		
			M U< 3		X						
			BB-A U< 3			X					X
			SC U< 3							X	
49	0	1210	G f> 1	X			X	X	X		
			M f> 1		X						
			B1 f> 1			X					X
			SC f> 1							X	
	1	1220	G f> 2	X			X	X	X		

Address	Bit	Parameter	Content	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
			M f> 2		X						
			BB-A f> 2			X					X
			SC f> 2							X	
	2	1230	G f> 3	X			X	X	X		
			M f> 3		X						
			BB-A f> 3			X					X
			SC f> 3							X	
	3	1240	G f< 1	X			X	X	X	X	
			M f< 1		X						
			BB-A f < 1			X					X
	4	1250	G f< 2	X			X	X	X		
			M f< 2		X						
			BB-A f< 2			X					X
			SC f< 2							X	
	5	1260	G f< 3	X			X	X	X		
			M f< 3		X						
			BB-A f< 3			X					X
			SC f< 3							X	
	Busbar/mains										
	6	1270	BB U> 1	X	X	X	X	X	X	X	
			BB-B U> 1								X

Address	Bit	Parameter	Content	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
	7	1280	BB U> 2	X	X	X	X	X	X	X	
			BB-B U> 2								X
	8	1290	BB U> 3	X	X	X	X	X	X	X	
			BB-B U> 3								X
	9	1300	BB U< 1	X	X	X	X	X	X	X	
			BB-B U< 1								X
	10	1310	BB U< 2	X	X	X	X	X	X	X	
			BB-B U< 2								X
	11	1320	BB U< 3	X	X	X	X	X	X	X	
			BB-B U< 3								X
	12	1330	BB U< 4	X	X	X	X	X	X	X	
			BB-B U< 4								X
	13	1350	BB f> 1	X	X	X	X	X	X	X	
			BB-B f> 1								X
	14	1360	BB f> 2	X	X	X	X	X	X	X	
			BB-B f> 2								X
	15	1370	BB f> 3	X	X	X	X	X	X	X	
			BB-B f> 3								X
50	0	1380	BB f< 1	X	X	X	X	X	X	X	
			BB-B f< 1								X
	1	1390	BB f< 2	X	X	X	X	X	X	X	

Address	Bit	Parameter	Content	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
			BB-B f< 2								X
	2	1400	BB f< 3	X	X	X	X	X	X	X	
			BB-B f< 3								X
	3	1410	BB f< 4	X	X	X	X	X	X	X	
			BB-B f< 4								X
	4	1420	df/dt (ROCOF)	X	X	X					
	5	1430	Vector jump	X	X	X					
	6	1440	BB pos. seq. volt. low	X	X	X					
	Generator/mains/busbar A/shore										
	7	1450	G P> 1	X			X	X	X		
			M P> 1		X						
			BA P> 1			X					X
			SC P> 1							X	
	8	1460	G P> 2	X			X	X	X		
			M P> 2		X						
			BA P> 2			X					X
			SC P> 2							X	
	9	1470	G P> 3	X			X	X	X		
			M P> 3		X						
			BA P> 3			X					X
			SC P> 3							X	

Address	Bit	Parameter	Content	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
	10	1480	G P> 4	X			X	X	X		
			M P> 4		X						
			BA P> 4			X					X
			SC P> 4							X	
	11	1490 1500 1510	G P> 5	X			X	X	X		
			M P> 5		X						
			BA P> 5			X					X
			SC P> 5							X	
	12		Unbalance curr.	X	X		X	X	X	X	
	13		Unbalance volt.	X	X		X	X	X	X	
	14	1520	G -Q>	X			X	X	X		
			M -Q>		X						
			BA -Q>			X					X
			SC -Q>							X	
	15	1530	G Q>	X			X	X	X		
			M Q>		X						
			BA Q>			X					X
			SC Q>							X	
51	**Synchronising**										
	0	2120	Synchronising window	X	X	X	X	X	X	X	X
	1	2130	Synchronising failure GB	X			X	X			

Address	Bit	Parameter	Content	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
			Synchronising failure TB		X						
			Synchronising failure BTB			X					X
	2	2140	Synchronising failure MB	X	X						
			Synchronising failure SGB						X		
			Synchronising failure SCB							X	
	3	2150	Phase sequence failure	X	X	X	X	X	X	X	X
	4	2160	GB open failure	X			X	X			
			TB open failure		X						
			BTB open failure			X					X
	5	2170	GB close failure	X			X	X			
			TB close failure		X						
			BTB close failure			X					X
	6	2180	GB pos. failure	X			X	X			
			TB pos. failure		X						
			BTB pos. failure			X					X
	7	2200	MB open failure	X	X						
			TB open failure					X			
			SGB open failure						X		
			SCB open failure							X	
	8	2210	MB close failure	X	X						
			TB close failure					X			

Address	Bit	Parameter	Content	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
			SGB close failure						X		
			SCB close failure							X	
	9	2220	MB pos. failure	X	X						
			TB pos. failure					X			
			SGB pos failure						X		
			SCB pos failure							X	
	10	2250	Close before excitation failure	X							
	11										
	12										
	13										
	14										
	15										
52	**Digital alarms**										
	0	3130	Digital alarm input	43	43	43	43	43	43	43	43
	1	3140	Digital alarm input	44	44	44	44	44	44	44	44
	2	3150	Digital alarm input	45	45	45	45	45	45	45	45
	3	3160	Digital alarm input	46	46	46	46	46	46	46	46
	4	3170	Digital alarm input	47	47	47	47	47	47	47	47
	5	3180	Digital alarm input	48	48	48	48	48	48	48	48
	6	3190	Digital alarm input	49	49	49	49	49	49	49	49
	7	3200	Digital alarm input	50	50	50	50	50	50	50	50

Address	Bit	Parameter	Content	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
	8	3210	Digital alarm input	51	51	51	51	51	51	51	51
	9	3220	Digital alarm input	52	52	52	52	52	52	52	52
	10	3230	Digital alarm input	53	53	53	53	53	53	53	53
	11	3240	Digital alarm input	54	54	54	54	54	54	54	54
	12	3250	Digital alarm input	55	55	55	55	55	55	55	55
	13										
	14										
	15										
53	0										
	1										
	2										
	3										
	4										
	5										
	6										
	7	3330	Digital alarm input	91	91	91	91	91	91	91	91
	8	3340	Digital alarm input	92	92	92	92	92	92	92	92
	9	3350	Digital alarm input	93	93	93	93	93	93	93	93
	10	3360	Digital alarm input	94	94	94	94	94	94	94	94
	11	3370	Digital alarm input	95	95	95	95	95	95	95	95
	12	3380	Digital alarm input	96	96	96	96	96	96	96	96

Address	Bit	Parameter	Content	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
	13	3390	Digital alarm input	97	97	97	97	97	97	97	97
	14										
	15										
54	0	3400	Multi-in. alarm	102	102	102	102	102	102	102	102
	1	3410	Multi-in. alarm	105	105	105	105	105	105	105	105
	2	3420	Multi-in. alarm	108	108	108	108	108	108	108	108
	3	3401	Wire fail.	102	102	102	102	102	102	102	102
	4	3411	Wire fail.	105	105	105	105	105	105	105	105
	5	3421	Wire fail.	108	108	108	108	108	108	108	108
	6	3430	Digital alarm input	112	112	112	112	112	112	112	112
	7	3440	Digital alarm input	113	113	113	113	113	113	113	113
	8	3450	Digital alarm input	114	114	114	114	114	114	114	114
	9	3460	Digital alarm input	115	115	115	115	115	115	115	115
	10	3470	Digital alarm input	116	116	116	116	116	116	116	116
	11	3480	Digital alarm input	117	117	117	117	117	117	117	117
	12	3490	Digital alarm input (Emer. stop)	118	118	118	118	118	118	118	118
	13										
	14										
	15										
55	0	3500	Digital alarm input	127	127	127	127	127	127	127	127

Address	Bit	Parameter	Content	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
	1	3510	Digital alarm input	128	128	128	128	128	128	128	128
	2	3520	Digital alarm input	129	129	129	129	129	129	129	129
	3	3530	Digital alarm input	130	130	130	130	130	130	130	130
	4	3540	Digital alarm input	131	131	131	131	131	131	131	131
	5	3550	Digital alarm input	132	132	132	132	132	132	132	132
	6	3560	Digital alarm input	133	133	133	133	133	133	133	133
	7										
	8										
	9										
	10										
	11										
	12										
	13										
	14										
	15										
	Analogue input alarm										
56	0	4000	4-20mA	91.1	91.1	91.1	91.1	91.1	91.1	91.1	91.1
	1	4010	4-20mA	91.2	91.2	91.2	91.2	91.2	91.2	91.2	91.2
	2	4020	Wire failure analogue	91	91	91	91	91	91	91	91
	3	4030	4-20mA	93.1	93.1	93.1	93.1	93.1	93.1	93.1	93.1
	4	4040	4-20mA	93.2	93.2	93.2	93.2	93.2	93.2	93.2	93.2

Address	Bit	Parameter	Content	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
	5	4050	Wire failure analogue	93	93	93	93	93	93	93	93
	6	4060	4-20mA	95.1	95.1	95.1	95.1	95.1	95.1	95.1	95.1
	7	4070	4-20mA	95.2	95.2	95.2	95.2	95.2	95.2	95.2	95.2
	8	4080	Wire failure analogue	95	95	95	95	95	95	95	95
	9	4090	4-20mA	97.1	97.1	97.1	97.1	97.1	97.1	97.1	97.1
	10	4100	4-20mA	97.2	97.2	97.2	97.2	97.2	97.2	97.2	97.2
	11	4110	Wire failure analogue	97	97	97	97	97	97	97	97
	12										
	13										
	14										
	15										
	Multi-functional input										
57	0	4120	4-20mA	102.1	102.1	102.1	102.1	102.1	102.1	102.1	102.1
	1	4130	4-20mA	102.2	102.2	102.2	102.2	102.2	102.2	102.2	102.2
	0	4140	V DC	102.1	102.1	102.1	102.1	102.1	102.1	102.1	102.1
	1	4150	V DC	102.2	102.2	102.2	102.2	102.2	102.2	102.2	102.2
	0	4160	PT	102.1	102.1	102.1	102.1	102.1	102.1	102.1	102.1
	1	4170	PT	102.2	102.2	102.2	102.2	102.2	102.2	102.2	102.2
	0	4180	VDO oil	102.1	102.1	102.1	102.1	102.1	102.1	102.1	102.1
	1	4190	VDO oil	102.2	102.2	102.2	102.2	102.2	102.2	102.2	102.2
	0	4200	VDO water	102.1	102.1	102.1	102.1	102.1	102.1	102.1	102.1

Address	Bit	Parameter	Content	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
	1	4210	VDO water	102.2	102.2	102.2	102.2	102.2	102.2	102.2	102.2
	0	4220	VDO fuel	102.1	102.1	102.1	102.1	102.1	102.1	102.1	102.1
	1	4230	VDO fuel	102.2	102.2	102.2	102.2	102.2	102.2	102.2	102.2
	2	4240	W. fail.	102	102	102	102	102	102	102	102
	3	4250	4-20mA	105.1	105.1	105.1	105.1	105.1	105.1	105.1	105.1
	4	4260	4-20mA	105.2	105.2	105.2	105.2	105.2	105.2	105.2	105.2
	3	4270	V DC	105.1	105.1	105.1	105.1	105.1	105.1	105.1	105.1
	4	4280	V DC	105.2	105.2	105.2	105.2	105.2	105.2	105.2	105.2
	3	4290	PT	105.1	105.1	105.1	105.1	105.1	105.1	105.1	105.1
	4	4300	PT	105.2	105.2	105.2	105.2	105.2	105.2	105.2	105.2
	3	4310	VDO oil	105.1	105.1	105.1	105.1	105.1	105.1	105.1	105.1
	4	4320	VDO oil	105.2	105.2	105.2	105.2	105.2	105.2	105.2	105.2
	3	4330	VDO water	105.1	105.1	105.1	105.1	105.1	105.1	105.1	105.1
	4	4340	VDO water	105.2	105.2	105.2	105.2	105.2	105.2	105.2	105.2
	3	4350	VDO fuel	105.1	105.1	105.1	105.1	105.1	105.1	105.1	105.1
	4	4360	VDO fuel	105.2	105.2	105.2	105.2	105.2	105.2	105.2	105.2
	5	4370	W. fail.	105	105	105	105	105	105	105	105
	6	4380	4-20mA	108.1	108.1	108.1	108.1	108.1	108.1	108.1	108.1
	7	4390	4-20mA	108.2	108.2	108.2	108.2	108.2	108.2	108.2	108.2
	6	4400	V DC	108.1	108.1	108.1	108.1	108.1	108.1	108.1	108.1
	7	4410	V DC	108.2	108.2	108.2	108.2	108.2	108.2	108.2	108.2

Address	Bit	Parameter	Content	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
	6	4420	PT	108.1	108.1	108.1	108.1	108.1	108.1	108.1	108.1
	7	4430	PT	108.2	108.2	108.2	108.2	108.2	108.2	108.2	108.2
	6	4440	VDO oil	108.1	108.1	108.1	108.1	108.1	108.1	108.1	108.1
	7	4450	VDO oil	108.2	108.2	108.2	108.2	108.2	108.2	108.2	108.2
	6	4460	VDO water	108.1	108.1	108.1	108.1	108.1	108.1	108.1	108.1
	7	4470	VDO water	108.2	108.2	108.2	108.2	108.2	108.2	108.2	108.2
	6	4480	VDO fuel	108.1	108.1	108.1	108.1	108.1	108.1	108.1	108.1
	7	4490	VDO fuel	108.2	108.2	108.2	108.2	108.2	108.2	108.2	108.2
	8	4500	Wire failure	108	108	108	108	108	108	108	108
	Analogue input alarm										
	9	4510	Oversp. 1	X			X	X	X		
	10	4520	Oversp. 2	X			X	X	X		
	11	4530	Crank failure	X			X	X			
	12	4540	Running feedback failure	X			X	X			
	13	4550	MPU wire failure	X			X	X			
	14	4560	Hz/V failure	X			X	X	X	X	
	15	4570	Start failure	X			X	X			
	Output										
58	0	5000	Relay	5	5	5	5	5	5	5	5
	1	5010	Relay	8	8	8	8	8	8	8	8
	2	5020	Relay	11	11	11	11	11	11	11	11

Address	Bit	Parameter	Content	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
	3	5030	Relay	14	14	14	14	14	14	14	14
	4	5040	Relay	17	17	17	17	17	17	17	17
	5	5050	Relay	T20	T20	T20	T20	T20	T20	T20	T20
	6	5060	Relay	T21	T21	T21	T21	T21	T21	T21	T21
	7	5070	Relay	29	29	29	29	29	29	29	29
	8	5080	Relay	31	31	31	31	31	31	31	31
	9	5090	Relay	33	33	33	33	33	33	33	33
	10	5100	Relay	35	35	35	35	35	35	35	35
	11	5110	Relay	57	57	57	57	57	57	57	57
	12	5120	Relay	59	59	59	59	59	59	59	59
	13	5130	Relay	61	61	61	61	61	61	61	61
	14	5140	Relay	63	63	63	63	63	63	63	63
	15										
	General										
59	0		Block mode	X		X					
	1		Manual mode	X							
			SWBD mode				X	X	X	X	X
	2		Semi auto mode	X	X	X	X	X			
	3		Auto mode	X	X	X	X	X			
	4		Test	X	X			X			
	5		Island	X	X						

Address	Bit	Parameter	Content	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
	6		AMF	X	X						
	7		Peak shaving	X	X						
	8		Fixed power	X	X						
	9		Mains power export	X	X						
	10		Load takeover	X	X						
	11		Power management	X		X					
	12		DG supply						X	X	
	13		SG/SC supply						X	X	
	14										
	15		AMF active	X	X						
60	**EIC alarm**										
	0	7570	Communication error	X			X	X	X	X	X
	1	7580	Warning	X			X	X	X		
	2	7590	Shutdown	X			X	X	X		
	3	7600	Overspeed	X			X	X	X		
	4	7610	Cool water temp. high 1	X			X	X	X		
	5	7620	Cool water temp. high 2	X			X	X	X		
	6	7630	Oil pressure low 1	X			X	X	X		
	7	7640	Oil pressure low 2	X			X	X	X		
	8										
	9										

Address	Bit	Parameter	Content	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
	10										
	11										
	12										
	13										
	14										
	15										
61	**Analogue inputs**										
	0	4800	4-20 mA	127.1	127.1	127.1	127.1	127.1	127.1	127.1	127.1
	1	4810	4-20 mA	127.2	127.2	127.2	127.2	127.2	127.2	127.2	127.2
	2	4820	W. fail input	127	127	127	127	127	127	127	127
	3	4830	4-20 mA	129.1	129.1	129.1	129.1	129.1	129.1	129.1	129.1
	4	4840	4-20 mA	129.2	129.2	129.2	129.2	129.2	129.2	129.2	129.2
	5	4850	W. fail input	129	129	129	129	129	129	129	129
	6	4860	4-20 mA	131.1	131.1	131.1	131.1	131.1	131.1	131.1	131.1
	7	4870	4-20 mA	131.2	131.2	131.2	131.2	131.2	131.2	131.2	131.2
	8	4880	W. fail input	131	131	131	131	131	131	131	131
	9	4890	4-20 mA	133.1	133.1	133.1	133.1	133.1	133.1	133.1	133.1
	10	4900	4-20 mA	133.2	133.2	133.2	133.2	133.2	133.2	133.2	133.2
	11	4910	W. fail input	133	133	133	133	133	133	133	133
	12										

Address	Bit	Parameter	Content	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
	13										
	14										
	15										

***Multi-input – unscaled values**

A short description of the unscaled values and how to interpret these according to the input type selected is made in this document.

The unscaled values have a full range of 0 to 1023 bit.

4-20mA

0mA:	0 bit
4mA:	170 bit
20mA:	853 bit
25mA:	1023 bit

Linearity between the unscaled value and the scaled value yields.

0-40V DC

0V DC:	0 bit
40V DC:	925 bit

Linearity between the unscaled value and the scaled value yields.

PT100

Linearity between the unscaled value and the input resistance yields according to the following equation:

Ω = (x + 509) * 100/771

x: Unscaled value.
Ω: PT resistance value.

PT1000

Linearity between the unscaled value and the input resistance yields according to the following equation:

Ω = (x + 519) * 10/79

x: Unscaled value.
Ω: PT resistance value.

VDO

Linearity between the unscaled value and the input resistance yields according to the following equations:

If maximum resistance on the sensor is less than or equal to 90.0Ω:

Ω = ((x * 1000) + 300)/10330

x: Unscaled value.
Ω: VDO resistance value.

If maximum resistance on the sensor is above 90.0Ω and less than or equal to 190.0Ω:

Ω = ((x * 1000) - 800)/5160

x: Unscaled value.
Ω: VDO resistance value.

If maximum resistance on the sensor is above 190.0Ω and less than or equal to 490.0Ω:

Ω = ((x * 1000) + 1000)/2070

x: Unscaled value.
Ω: VDO resistance value.

If maximum resistance on the sensor is above 490.0Ω:

Ω = ((x * 1000) + 294)/520

x: Unscaled value.
Ω: VDO resistance value.

Binary

Input high: < 50 bit
Input low: ≥ 50 bit
Cable failure: > 950 bit

It is recommended to use the scaled values for PT100/1000 and VDO readings.

Measurement table (read only) (function code 04h)

Address		Content		AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
501		U_{L1-L2}	Generator voltage L1-L2 [V]	X			X	X	X		
		U_{L1-L2}	Mains voltage L1-L2 [V]		X						
		U_{L1-L2}	Bus A voltage L1-L2 [V]			X					X
		U_{L1-L2}	Shore voltage L1-L2 [V]							X	
502		U_{L2-L3}	Generator voltage L2-L3 [V]	X			X	X	X		
		U_{L2-L3}	Mains voltage L2-L3 [V]		X						
		U_{L2-L3}	Bus A voltage L2-L3 [V]			X					X
		U_{L2-L3}	Shore voltage L2-L3 [V]							X	
503		U_{L3-L1}	Generator voltage L3-L1 [V]	X			X	X	X		
		U_{L3-L1}	Mains voltage L3-L1 [V]		X						
		U_{L3-L1}	Bus A voltage L3-L1 [V]			X					X
		U_{L3-L1}	Shore voltage L3-L1 [V]							X	
504		U_{L1-N}	Generator voltage L1-N [V]	X			X	X	X		
		U_{L1-N}	Mains voltage L1-N [V]		X						
		U_{L1-N}	Bus A voltage L1-N [V]			X					X
		U_{L1-N}	Shore voltage L1-N [V]							X	
505		U_{L2-N}	Generator voltage L2-N [V]	X			X	X	X		
		U_{L2-N}	Mains voltage L2-N [V]		X						

Address		Content		AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
		U_{L2-N}	Bus A voltage L2-N [V]			X					X
		U_{L2-N}	Shore voltage L2-N [V]							X	
506		U_{L3-N}	Generator voltage L3-N [V]	X			X	X	X		
		U_{L3-N}	Mains voltage L3-N [V]		X						
		U_{L3-N}	Bus A voltage L3-N [V]			X					X
		U_{L3-N}	Shore voltage L3-N [V]							X	
507		f_{L1}	Generator f L1 [Hz/100]	X			X	X	X		
		f_{L1}	Mains f L1 [Hz/100]		X						
		f_{L1}	Bus A f L1 [Hz/100]			X					X
		f_{L1}	Shore f L1 [Hz/100]							X	X
508		f_{L2}	Generator f L2 [Hz/100]	X			X	X	X		
		f_{L2}	Mains f L2 [Hz/100]		X						
		f_{L2}	Bus A f L2 [Hz/100]			X					X
		f_{L2}	Shore f L2 [Hz/100]							X	
509		f_{L3}	Generator f L3 [Hz/100]	X			X	X	X		
		f_{L3}	Mains f L3 [Hz/100]		X						
		f_{L3}	Bus A f L3 [Hz/100]			X					X
		f_{L3}	Shore f L3 [Hz/100]							X	
510		Phi	U gen. phase angle L1-L2 [Deg/10]	X			X	X	X		
		Phi	U mains phase angle L1-L2 [Deg/10]		X						

Address		Content		AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
		Phi	U BA phase angle L1-L2 [Deg/10]			X					X
		Phi	U SC phase angle L1-L2 [Deg/10]							X	
511		Phi	U gen. phase angle L2-L3 [Deg/10]	X			X	X	X		
		Phi	U mains phase angle L2-L3 [Deg/10]		X						
		Phi	U BA phase angle L2-L3 [Deg/10]			X					X
		Phi	U SC phase angle L2-L3 [Deg/10]							X	
512		Phi	U gen. phase angle L3-L1 [Deg/10]	X			X	X	X		
		Phi	U mains phase angle L3-L1 [Deg/10]		X						
		Phi	U BA phase angle L3-L1 [Deg/10]			X					X
		Phi	U SC phase angle L3-L1 [Deg/10]							X	
513		I_{L1}	Generator current L1 [A]	X			X	X	X		
		I_{L1}	Mains current L1 [A]		X						
		I_{L1}	Bus A current L1 [A]			X					X
		I_{L1}	Shore current L1 [A]							X	
514		I_{L2}	Generator current L2 [A]	X			X	X	X		
		I_{L2}	Mains current L2 [A]		X						
		I_{L2}	Bus A current L2 [A]			X					X

Address		Content		AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
		I_{L2}	Shore current L2 [A]							X	
515		I_{L3}	Generator current L3 [A]	X			X	X	X		
		I_{L3}	Mains current L3 [A]		X						
		I_{L3}	Bus A current L3 [A]			X					X
		I_{L3}	Shore current L3 [A]							X	
516		$P_{GEN\ L1}$	Generator power L1 [kW]	X			X	X	X		
		$P_{MAINS\ L1}$	Mains power L1 [kW]		X						
		$P_{BA\ L1}$	Bus A power L1 [kW]			X					X
		$P_{SC\ L1}$	Bus A power L1 [kW]							X	
517		$P_{GEN\ L2}$	Generator power L2 [kW]	X			X	X	X		
		$P_{MAINS\ L2}$	Mains power L2 [kW]		X						
		$P_{BA\ L2}$	Bus A power L2 [kW]			X					X
		$P_{SC\ L2}$	Bus A power L2 [kW]							X	
518		$P_{GEN\ L3}$	Generator power L3 [kW]	X			X	X	X		
		$P_{MAINS\ L3}$	Mains power L3 [kW]		X						
		$P_{BA\ L3}$	Bus A power L3 [kW]			X					X
		$P_{SC\ L3}$	Bus A power L3 [kW]							X	
519		P_{GEN}	Generator power [kW]	X			X	X	X		
		P_{MAINS}	Mains power [kW]		X						
		P_{BA}	Bus A power [kW]			X					X
		P_{SC}	Shore power [kW]							X	
520		$Q_{GEN\ L1}$	Generator reactive power L1 [kVAr]	X			X	X	X		

Address		Content		AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
		$Q_{MAINS\ L1}$	Mains reactive power L1 [kVAr]		X						
		$Q_{BA\ L1}$	Bus A reactive power L1 [kVAr]			X					
		$Q_{SC\ L1}$	Bus A reactive power L1 [kVAr]							X	
521		$Q_{GEN\ L2}$	Generator reactive power L2 [kVAr]	X			X	X	X		
		$Q_{MAINS\ L2}$	Mains reactive power L2 [kVAr]		X						
		$Q_{BA\ L2}$	Bus A reactive power L2 [kVAr]			X					
		$Q_{SC\ L2}$	Bus A reactive power L2 [kVAr]							X	
522		$Q_{GEN\ L3}$	Generator reactive power L3 [kVAr]	X			X	X	X		
		$Q_{MAINS\ L3}$	Mains reactive power L3 [kVAr]		X						
		$Q_{BA\ L3}$	Bus A reactive power L3 [kVAr]			X					
		$Q_{SC\ L3}$	Bus A reactive power L3 [kVAr]							X	
523		Q_{GEN}	Generator reactive power [kVAr]	X			X	X	X		
		Q_{MAINS}	Mains reactive power [kVAr]		X						
		Q_{BA}	Bus A reactive power [kVar]			X					X
		Q_{SC}	Shore reactive power [kVAr]							X	
524		$S_{GEN\ L1}$	Generator apparent power L1 [kVA]	X			X	X	X		
		$S_{MAINS\ L1}$	Mains apparent power L1 [kVA]		X						
		$S_{BA\ L1}$	Bus A apparent power L1 [kVA]			X					
		$S_{SC\ L1}$	Bus A apparent power L1 [kVA]							X	
525		$S_{GEN\ L2}$	Generator apparent power L2 [kVA]	X			X	X	X		
		$S_{MAINS\ L2}$	Mains apparent power L2 [kVA]		X						
		$S_{BA\ L2}$	Bus A apparent power L2 [kVA]			X					
		$S_{SC\ L2}$	Bus A apparent power L2 [kVA]							X	

Address		Content		AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
526		$S_{GEN\ L3}$	Generator apparent power L3 [kVA]	X			X	X	X		
		$S_{MAINS\ L3}$	Mains apparent power L3 [kVA]		X						
		$S_{BA\ L3}$	Bus A apparent power L3 [kVA]			X					X
		$S_{SC\ L3}$	Bus A apparent power L3 [kVA]							X	
527		S_{GEN}	Generator apparent power [kVA]	X			X	X	X		
		S_{MAINS}	Mains apparent power [kVA]		X						
		S_{BA}	Bus A apparent power [kVA]			X					X
		S_{SC}	Shore apparent power [kVA]							X	
528	[Hi]	R_{GEN}	Reactive energy counter [kVArh]	X			X	X	X		
529	[Lo]										
528	[Hi]	R_{MAINS}	Reactive energy counter [kVArh]		X						
529	[Lo]										
528	[Hi]	R_{BA}	Reactive energy counter [kVArh]			X					X
529	[Lo]										
528	[Hi]	R_{SC}	Reactive energy counter [kVArh]							X	
529	[Lo]										
530	[Hi]	E_{GEN}	Active energy counter, day [kWh]	X			X	X	X		
531	[Lo]										
530	[Hi]	E_{MAINS}	Active energy counter, day [kWh]		X						
531	[Lo]										
530	[Hi]	E_{BA}	Active energy counter, day [kWh]			X					X
531	[Lo]										
530	[Hi]	E_{SC}	Active energy counter, day [kWh]							X	
531	[Lo]										
532	[Hi]	E_{GEN}	Active energy counter, week	X			X	X	X		

Address		Content		AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
533	[Lo]		[kWh]								
532	[Hi]	E_{MAINS}	Active energy counter, week [kWh]		X						
533	[Lo]										
532	[Hi]	E_{BA}	Active energy counter, week [kWh]			X					X
533	[Lo]										
532	[Hi]	E_{SC}	Active energy counter, week [kWh]							X	
533	[Lo]										
534	[Hi]	E_{GEN}	Active energy counter, month [kWh]	X			X	X	X		
535	[Lo]										
534	[Hi]	E_{MAINS}	Active energy counter, month [kWh]		X						
535	[Lo]										
534	[Hi]	E_{BA}	Active energy counter, month [kWh]			X					X
535	[Lo]										
534	[Hi]	E_{SC}	Active energy counter, month [kWh]							X	
535	[Lo]										
536	[Hi]	E_{GEN}	Active energy counter, total [kWh]	X			X	X	X		
537	[Lo]										
536	[Hi]	E_{MAINS}	Active energy counter, total [kWh]		X						
537	[Lo]										
536	[Hi]	E_{BA}	Active energy counter, total [kWh]			X					X
537	[Lo]										
536	[Hi]	E_{SC}	Active energy counter, total [kWh]							X	
537	[Lo]										
538		Cos-phi	Generator PF [cosPhi/100]	X			X	X	X		
		Cos-phi	Mains PF [cosPhi/100]		X						

Address		Content		AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
		Cos-phi	Bus A PF [cosPhi/100]			X					X
		Cos-phi	Shore PF [cosPhi/100]							X	
539		$U_{BBL1-L2}$	U BB L1-L2 [V]	X	X	X	X	X	X	X	X
540		$U_{BBL2-L3}$	U BB L2-L3 [V]	X	X	X	X	X	X	X	X
541		$U_{BBL3-L1}$	U BB L3-L1 [V]	X	X	X	X	X	X	X	X
542		U_{BBL1-N}	U BB L1-N [V]	X	X	X	X	X	X	X	X
543		U_{BBL2-N}	U BB L2-N [V]	X	X	X	X	X	X	X	X
544		U_{BBL3-N}	U BB L3-N [V]	X	X	X	X	X	X	X	X
545		F_{BB}	BB FL1 [Hz/100]	X	X	X	X	X	X	X	X
546		F_{BB}	f BB L2 [Hz/100]	X	X	X	X	X	X	X	X
547		F_{BB}	f BB L3 [Hz/100]	X	X	X	X	X	X	X	X
548		$PHI_{BBL1-L2}$	U BB phase angle L1-L2 [Deg/10]	X	X	X	X	X	X	X	X
549		$PHI_{BBL2-L3}$	U BB phase angle L2-L3 [Deg/10]	X	X	X	X	X	X	X	X
550		$PHI_{BBL3-L1}$	U BB phase angle L3-L1 [Deg/10]	X	X	X	X	X	X	X	X
551		$PHI_{BBL1-DGL1}$	U BB L1 - U GEN L1 phase angle [Deg/10]	X			X	X	X		
		$PHI_{BBL1-ML1}$	U BB L1 - U Mains L1 phase angle [Deg/10]		X						
		$PHI_{BAL1-BBL1}$	U BB A L1 - U BB B L1 phase angle [Deg/10]			X					X
		$PHI_{SCL1-BBL1}$	U BB A L1 - U BB B L1 phase angle [Deg/10]							X	

Address		Content		AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
552		$PHI_{BBL2-DGL2}$	U BB L2 - U GEN L2 phase angle [Deg/10]	X			X	X	X		
		$PHI_{BBL2-MAINSL2}$	U BB L2 - U mains L2 phase angle [Deg/10]		X						
		$PHI_{BBL2-BAL2}$	U BB L2 - U bus A L2 phase angle [Deg/10]			X					X
		$PHI_{SCL2-BAL2}$	U BB L2 - U bus A L2 phase angle [Deg/10]							X	
553		$PHI_{BBL3-DGL3}$	U BB L3 - U GEN L3 phase angle [Deg/10]	X			X	X	X		
		$PHI_{BBL3-MAINSL3}$	U BB L3 - U mains L3 phase angle [Deg/10]		X						
		$PHI_{BBL3-BAL3}$	U BB L3 - U bus A L3 phase angle [Deg/10]			X					X
		$PHI_{SCL3-BAL3}$	U BB L3 - U bus A L3 phase angle [Deg/10]							X	
554	[Hi]	Abs. run. hours	Absolute. run hours	X			X	X	X		
555	[Lo]										
556	[Hi]	Rel.. run. hours	Relative. run hours	X			X	X	X		
557	[Lo]										
558		Alarms	No. of alarms	X	X	X	X	X	X	X	X
559		Alarms	No. of unack. alarms	X	X	X	X	X	X	X	X
560		Alarms	No. of active acknowledged alarms	X	X	X	X	X	X	X	X
561		Run. min.	Running min. counter, shutdown override	X				X			
562		Run. hours	Running hour counter, shutdown override	X				X			
563		GB_{oper}	No. of GB operations	X			X	X			

Address		Content		AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
		TB_{oper}	No. of TB operations		X						
		BTB_{oper}	No. of BTB operations			X					X
564		MB_{oper}	No. of MB operations	X	X		X				
		TB_{oper}	No. of TB operations					X			
		SGB_{oper}	No. of SGB operations						X		
		SCB_{oper}	No. of SCB operations							X	
565											
566		Start attempts	Start attempts	X			X	X			
567		U_{SUPPLY}	DC supply term. 1-2 [V/10]	X	X	X	X	X	X	X	X
568		$U_{SUPPLY\ M4}$	DC supply term. 98-99 [V/10]	X	X	X	X	X	X	X	X
569		Service	Service timer 1 run. hours	X			X	X	X		
570		Service	Service timer 1 run. days	X			X	X	X		
571		Service	Service timer 2 run. hours	X			X	X	X		
572		Service	Service timer 2 run. days	X			X	X	X		
573											
574											
575											
576		RPM	RPM	X			X	X	X		
577											
578											
579											

Address			Content	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
580			Multi-input 102 unscaled	X	X	X	X	X	X	X	X
580			VDO input 22 unscaled								
581			Multi-input 105 unscaled	X	X	X	X	X	X	X	X
581			VDO input 35 unscaled								
582			Multi-input 108 unscaled	X	X	X	X	X	X	X	X
582			VDO input 23 unscaled								
583			Multi-input 102 scaled	X	X	X	X	X	X	X	X
583			VDO input 22 scaled								
584			Multi-input 105 scaled	X	X	X	X	X	X	X	X
584			VDO input 35 scaled								
585			Multi-input 108 scaled	X	X	X	X	X	X	X	X
585			VDO input 23 scaled								
586		Ain	4-20mA input, scaled	91	91	91	91	91	91	91	91
587		Ain	4-20mA input, scaled	93	93	93	93	93	93	93	93
588		Ain	4-20mA input, scaled	95	95	95	95	95	95	95	95
589		Ain	4-20mA input, scaled	97	97	97	97	97	97	97	97
590											
591		P_{BB}	BUS power		105						
		P_{BA}	Bus A			105					
592		P_{MAINS}	Mains power [kW]	102	102						
		P_{TB}	Tie breaker power					102			
593			Engine comms (see H5 manual)	X			X	X			
594			Engine comms (see H5 manual)	X			X	X			
595			Engine comms (see H5 manual)	X			X	X			
596			Engine comms (see H5 manual)	X			X	X			

Address			Content	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
597			Engine comms (see H5 manual)	X			X	X			
598			Engine comms (see H5 manual)	X			X	X			
599			Engine comms (see H5 manual)	X			X	X			
600			Engine comms (see H5 manual)	X			X	X			
601			Engine comms (see H5 manual)	X			X	X			
602			Engine comms (see H5 manual)	X			X	X			
603			Engine comms (see H5 manual)	X			X	X			
604			Engine comms (see H5 manual)	X			X	X			
605			Engine comms (see H5 manual)	X			X	X			
606			Engine comms (see H5 manual)	X			X	X			
607			Engine comms (see H5 manual)	X			X	X			
608			Engine comms (see H5 manual)	X			X	X			
609			Engine comms (see H5 manual)	X			X	X			
610			Engine comms (see H5 manual)	X			X	X			
611			Engine comms (see H5 manual)	X			X	X			
612			Engine comms (see H5 manual)	X			X	X			
613			Engine comms (see H5 manual)	X			X	X			
614			Engine comms (see H5 manual)	X			X	X			
615			Engine comms (see H5 manual)	X			X	X			
616			Engine comms (see H5 manual)	X			X	X			
617			Engine comms (see H5 manual)	X			X	X			
618			Engine comms (see H5 manual)	X			X	X			
619			Engine comms (see H5 manual)	X			X	X			
620			Engine comms (see H5 manual)	X			X	X			
621			Engine comms (see H5 manual)	X			X	X			
622			Engine comms (see H5 manual)	X			X	X			

Address			Content	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
623			Engine comms (see H5 manual)	X			X	X			
624			Engine comms (see H5 manual)	X			X	X			
625			Engine comms (see H5 manual)	X			X	X			
626			Engine comms (see H5 manual)	X			X	X			
627			Engine comms (see H5 manual)	X			X	X			
628			Engine comms (see H5 manual)	X			X	X			
629			Engine comms (see H5 manual)	X			X	X			
630			Engine comms (see H5 manual)	X			X	X			
631			Engine comms (see H5 manual)	X			X	X			
632			Engine comms (see H5 manual)	X			X	X			
633			Engine comms (see H5 manual)	X			X	X			
634			Engine comms (see H5 manual)	X			X	X			
635			Engine comms (see H5 manual)	X			X	X			
636			Engine comms (see H5 manual)	X			X	X			
637			Engine comms (see H5 manual)	X			X	X			
638			Engine comms (see H5 manual)	X			X	X			
639			Engine comms (see H5 manual)	X			X	X			
640			Engine comms (see H5 manual)	X			X	X			
641			Engine comms (see H5 manual)	X			X	X			
642		RegAddr.	Control register address 0	X	X	X	X	X			
643		RegAddr.	Control register address 1	X	X	X	X	X			
644		RegAddr.	Control register address 2	X	X	X	X	X			
645		RegAddr.	Control register address 3	X	X	X	X	X			
646		RegAddr.	Control register address 4	X	X	X	X	X			
647		RegAddr.	Control register address 5	X	X	X	X	X			

Address		Content		AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
648		RegAddr.	Control register address 6	X	X	X	X	X			
649		RegAddr.	Control register address 7	X	X	X	X	X			
650		RegAddr	Control register address 8	X	X	X	X	X			
651		RegAddr	Control register address 9	X	X	X	X	X			
652		RegAddr	Control register address 10	X	X	X	X	X			
653-659			Reserved for control registers								
656		Ain	Analogue input 127	X	X	X	X	X	X	X	X
657		Ain	Analogue input 129	X	X	X	X	X	X	X	X
658		Ain	Analogue input 131	X	X	X	X	X	X	X	X
659		Ain	Analogue input 133	X	X	X	X	X	X	X	X
660		Ext Ain	External Ain 1 (unscaled)	X	X	X	X	X	X	X	X
661		Ext Ain	External Ain 2 (unscaled)	X	X	X	X	X	X	X	X
662		Ext Ain	External Ain 3 (unscaled)	X	X	X	X	X	X	X	X
663		Ext Ain	External Ain 4 (unscaled)	X	X	X	X	X	X	X	X
664		Ext Ain	External Ain 5 (unscaled)	X	X	X	X	X	X	X	X
665		Ext Ain	External Ain 6 (unscaled)	X	X	X	X	X	X	X	X
666		Ext Ain	External Ain 7 (unscaled)	X	X	X	X	X	X	X	X
667		Ext Ain	External Ain 8 (unscaled)	X	X	X	X	X	X	X	X
668-699											
700			Nominal power active (1-4)	X	X	X	X	X	X		
701			Mains power transducer used	X							
			Tie breaker power transducer used					X			
702-899											

Address			Content	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
900			Engine comms (see H5 manual)	X							
901-999			Reserved for engine communication								

Alarm and status table (read only) (function code 04h)

Address	Bit	Channel	Content	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
1000	**Generator/mains/busbar A/shore connection**										
	0	1000	G -P> 1	X			X	X	X		
			M -P> 1		X						
			BA -P> 1			X					X
			SC -P> 1							X	
	1	1010	G -P> 2	X			X	X	X		
			M -P> 2		X						
			BA -P> 2			X					X
			SC -P> 2							X	
	2	1020	Reserved								
	3	1030	G I> 1	X			X	X	X		
			M I> 1		X						
			BA I> 1			X					X
			SC I> 1							X	
	4	1040	G I> 2	X			X	X	X		
			M I> 2		X						
			BA I> 2			X					X
			SC I> 2							X	

Address	Bit	Channel	Content	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
	5	1050	G I> 3	X			X	X	X		
			M I> 3		X						
			BA I> 3			X					X
			SC I> 3							X	
	6	1060	G I> 4	X			X	X	X		
			M I> 4		X						
			BA I> 4			X					X
			SC I> 4							X	
	7	1090	Reserved								
	8	1110	G Iv>	X	X	X	X	X	X	X	X
	9	1130	G I>> 1	X			X	X	X		
			M I>> 1		X						
			BA I>> 1			X					X
			SC I>> 1							X	
	10	1140	G I>> 2	X			X	X	X		
			M I>> 2		X						
			BA I>> 2			X					X
			SC I>> 2							X	
	11	1150	G U> 1	X			X	X	X		
			M U> 1		X						
			BA U> 1			X					X

Address	Bit	Channel	Content	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
			SC U> 1							X	
	12	1160	G U> 2	X			X	X	X		
			M U> 2		X						
			BA U> 2			X					X
			SC U> 2							X	
	13	1170	G U< 1	X			X	X	X		
			M U< 1		X						
			BA U< 1			X					X
			SC U< 1							X	
	14	1180	G U< 2	X			X	X	X		
			M U< 2		X						
			BA U< 2			X					X
			SC U< 2							X	
	15	1190	G U< 3	X			X	X	X		
			M U< 3		X						
			BA U< 3			X					X
			SC U< 3							X	
1001	0	1210	G f> 1	X			X	X	X		
			M f> 1		X						
			BA f> 1			X					X
			BA f> 1							X	

Address	Bit	Channel	Content	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
	1	1220	G f> 2	X			X	X	X		
			M f> 2		X						
			BA f> 2			X					X
			SC f> 2							X	
	2	1230	G f> 3	X			X	X	X		
			M f> 3		X						
			BA f> 3			X					X
			SC f> 3							X	
	3	1240	G f< 1	X			X	X	X	X	
			M f< 1		X						
			BA f < 1			X					X
	4	1250	G f< 2	X			X	X	X		
			M f< 2		X						
			BA f< 2			X					X
			SC f< 2							X	
	5	1260	G f< 3	X			X	X	X		
			M f< 3		X						
			BA f< 3			X					X
			SC f< 3							X	
	BB/mains										

Address	Bit	Channel	Content	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
	6	1270	BB U> 1	X	X	X	X	X	X	X	X
	7	1280	BB U> 2	X	X	X	X	X	X	X	X
	8	1290	BB U> 3	X	X	X	X	X	X	X	X
	9	1300	BB U< 1	X	X	X	X	X	X	X	X
	10	1310	BB U< 2	X	X	X	X	X	X	X	X
	11	1320	BB U< 3	X	X	X	X	X	X	X	X
	12	1330	BB U< 4	X	X	X	X	X	X	X	X
	13	1340	BB f> 1	X	X	X	X	X	X	X	X
	14	1350	BB f> 2	X	X	X	X	X	X	X	X
	15	1360	BB f> 3	X	X	X	X	X	X	X	X
1002	0	1370	BB f< 1	X	X	X	X	X	X	X	X
	1	1380	BB f< 2	X	X	X	X	X	X	X	X
	2	1390	BB f< 3	X	X	X	X	X	X	X	X
	3	1400	BB f< 4	X	X	X	X	X	X	X	X
	4	1410	df/dt (ROCOF)	X	X	X					
	5	1420	Vector jump	X	X	X					
	6	1430	BB pos. seq. volt. low	X	X	X					
	Generator/mains/busbar A/Shore										
	7	1440	G P> 1	X			X	X	X		
			M P> 1		X						
			BA P> 1			X					X

Address	Bit	Channel	Content	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
			SC P> 1							X	
	8	1450	G P> 2	X			X	X	X		
			M P> 2		X						
			BA P> 2			X					X
			SC P> 2							X	
	9	1460	G P> 3	X			X	X	X		
			M P> 3		X						
			BA P> 3			X					X
			SC P> 3							X	
	10	1470	G P> 4	X			X	X	X		
			M P> 4		X						
			BA P> 4			X					X
			SC P> 4							X	
	11	1480	G P> 5	X			X	X	X		
			M P> 5		X						
			BA P> 5			X					X
			SC P> 5							X	
	12	1490	Unbalance curr.	X	X		X	X	X	X	
	13	1500	Unbalance volt.	X	X		X	X	X	X	
	14	1510	G -Q>	X			X	X	X		

Address	Bit	Channel	Content	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
			M -Q>		X						
			BA -Q>			X					X
			SC -Q>							X	
	15	1520	G Q>	X			X	X	X		
			M Q>		X						
			BA Q>			X					X
			SC Q>							X	
1003	**Generator/busbar**										
	0	1530	Gen. neg. seq. I	X			X	X	X		
			Mains neg. seq. I		X						
			Bus A neg. seq. I			X					X
	1	1540	Generator neg. seq. U	X			X	X	X		
			Mains neg. seq. U		X						
			Bus A neg. seq. U			X					X
	2	1570	Gen. zero seq. I	X			X	X	X		
			Mains zero seq. I		X						
			Bus A zero seq. I			X					X
	3	1580	Zero seq. U	X			X	X	X		X
			Mains zero seq. U		X						
			Bus A zero seq. U			X					X
	Busbar/Mains										

Address	Bit	Channel	Content	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
	4	1600	Directional overcurrent 1	X	X	X					
	5	1610	Directional overcurrent 2	X	X	X					
	6	1620	BB unbalance U	X	X	X	X	X	X	X	X
	7	1800	NEL 1 I>	X	X		X	X	X	X	
	8	1810	NEL 2 I>	X	X		X	X	X	X	
	9	1820	NEL 3 I>	X	X		X	X	X	X	
	10	1830	NEL 1 BB f<	X	X		X	X	X	X	
	11	1840	NEL 2 BB f<	X	X		X	X	X	X	
	12	1850	NEL 3 BB f<	X	X		X	X	X	X	
	13	1860	NEL 1 P>	X	X		X	X	X	X	
	14	1870	NEL 2 P>	X	X		X	X	X	X	
	15	1880	NEL 3 P>	X	X		X	X	X	X	
1004	0	1890	NEL 1 P>>	X	X		X	X	X	X	
	1	1900	NEL 2 P>>	X	X		X	X	X	X	
	2	1910	NEL 3 P>>	X	X		X	X	X	X	
	3	1930	DG/SG max parallel time				X				
	4	1940	DG/SC max parallel time				X				
	5	1950	EDG/MSB max parallel time					X			
	6										
	7										
	8										

Address	Bit	Channel	Content	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
	9										
	10										
	11										
	12										
	13										
	14										
	15										
1005	**Synchronising**										
	0	2120	Synchronising window	X	X	X	X	X	X	X	X
	1	2130	Synchronising failure GB	X			X	X			
			Synchronising failure TB		X						
			Synchronising failure BTB			X					X
	2	2140	Synchronising failure MB	X	X						
			Synchronising failure SGB						X		
			Synchronising failure SCB							X	
			Synchronising failure TB					X			
	3	2150	Phase seq. failure	X	X	X	X	X	X	X	X
	4	2160	GB open failure	X			X	X			
			TB open failure		X						
			BTB open failure			X					X
	5	2170	GB close failure	X			X	X			

Address	Bit	Channel	Content	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
			TB close failure		X						
			BTB close failure			X					X
	6	2180	GB pos. failure	X			X	X			
			TB pos. failure		X						
			BTB pos. failure			X					X
	7	2200	MB open failure	X	X						
			SGB open failure						X		
			SCB open failure							X	
			TB open failure					X			
	8	2210	MB close failure	X	X						
			SGB close failure						X		
			SCB close failure							X	
			TB close failure					X			
	9	2220	MB pos. failure	X	X						
			SGB pos. failure						X		
			SCB pos. failure							X	
			TB pos. failure					X			
	10	2270	Close before excitation failure	X							
	11										
	12										
	13										

Address	Bit	Channel	Content	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
	14										
	15										
1006	**Regulation**										
	0	2560	GOVERNOR regulation fail.	X			X	X			
	1	2630	Deload error	X			X	X			
	2	2680	AVR regulation fail.	X			X	X			
	3	2960	P loadshare fail.				X	X			
	4	2970	Q loadshare fail.				X	X			
	5										
	6										
	7										
	8										
	9										
	10										
	11										
	12										
	13										
	14										
	15										
1007	**Digital alarms**										
	0	3000	Digital alarm input	23	23	23	23	23	23	23	23

Address	Bit	Channel	Content	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
	1	3010	Digital alarm input	24	24	24	24	24	24	24	24
	2	3020	Digital alarm input	25	25	25	25	25	25	25	25
	3	3030	Digital alarm input	26	26	26	26	26	26	26	26
	4	3040	Digital alarm input	27	27	27	27	27	27	27	27
	5		Not used								
	6	3060	Digital alarm input	29	29	29	29	29	29	29	29
	7	3070	Digital alarm input	30	30	30	30	30	30	30	30
	8	3080	Digital alarm input	31	31	31	31	31	31	31	31
	9	3090	Digital alarm input	32	32	32	32	32	32	32	32
	10	3100	Digital alarm input	33	33	33	33	33	33	33	33
	11	3110	Digital alarm input	34	34	34	34	34	34	34	34
	12	3120	Digital alarm input	35	35	35	35	35	35	35	35
	13										
	14										
	15										
1008	0	3130	Digital alarm input	43	43	43	43	43	43	43	43
	1	3140	Digital alarm input	44	44	44	44	44	44	44	44
	2	3150	Digital alarm input	45	45	45	45	45	45	45	45
	3	3160	Digital alarm input	46	46	46	46	46	46	46	46
	4	3170	Digital alarm input	47	47	47	47	47	47	47	47
	5	3180	Digital alarm input	48	48	48	48	48	48	48	48

Address	Bit	Channel	Content	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
	6	3190	Digital alarm input	49	49	49	49	49	49	49	49
	7	3200	Digital alarm input	50	50	50	50	50	50	50	50
	8	3210	Digital alarm input	51	51	51	51	51	51	51	51
	9	3220	Digital alarm input	52	52	52	52	52	52	52	52
	10	3230	Digital alarm input	53	53	53	53	53	53	53	53
	11	3240	Digital alarm input	54	54	54	54	54	54	54	54
	12	3250	Digital alarm input	55	55	55	55	55	55	55	55
	13										
	14										
	15										
1009	0	3260	Digital alarm input	65	65	65	65	65	65	65	65
	1	3270	Digital alarm input	66	66	66	66	66	66	66	66
	2	3280	Digital alarm input	67	67	67	67	67	67	67	67
	3	3290	Digital alarm input	68	68	68	68	68	68	68	68
	4	3300	Digital alarm input	69	69	69	69	69	69	69	69
	5	3310	Digital alarm input	70	70	70	70	70	70	70	70
	6	3320	Digital alarm input	71	71	71	71	71	71	71	71
	7	3330	Digital alarm input	91	91	91	91	91	91	91	91
	8	3340	Digital alarm input	92	92	92	92	92	92	92	92
	9	3350	Digital alarm input	93	93	93	93	93	93	93	93
	10	3360	Digital alarm input	94	94	94	94	94	94	94	94

Address	Bit	Channel	Content	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
	11	3370	Digital alarm input	95	95	95	95	95	95	95	95
	12	3380	Digital alarm input	96	96	96	96	96	96	96	96
	13	3390	Digital alarm input	97	97	97	97	97	97	97	97
	14										
	15										
1010	0	3400	Multi-in. alarm	102	102	102	102	102	102	102	102
	1	3410	Multi-in. alarm	105	105	105	105	105	105	105	105
	2	3420	Multi-in. alarm	108	108	108	108	108	108	108	108
	3	3401	Wire fail.	102	102	102	102	102	102	102	102
	4	3411	Wire fail.	105	105	105	105	105	105	105	105
	5	3421	Wire fail.	108	108	108	108	108	108	108	108
	6	3430	Digital alarm input	112	112	112	112	112	112	112	112
	7	3440	Digital alarm input	113	113	113	113	113	113	113	113
	8	3450	Digital alarm input	114	114	114	114	114	114	114	114
	9	3460	Digital alarm input	115	115	115	115	115	115	115	115
	10	3470	Digital alarm input	116	116	116	116	116	116	116	116
	11	3480	Digital alarm input	117	117	117	117	117	117	117	117
	12	3490	Digital alarm input (Emergency stop)	118	118	118	118	118	118	118	118
	13										
	14										

Address	Bit	Channel	Content	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
	15										
1011	0	3500	Digital alarm input	127	127	127	127	127	127	127	127
	1	3510	Digital alarm input	128	128	128	128	128	128	128	128
	2	3520	Digital alarm input	129	129	129	129	129	129	129	129
	3	3530	Digital alarm input	130	130	130	130	130	130	130	130
	4	3540	Digital alarm input	131	131	131	131	131	131	131	131
	5	3550	Digital alarm input	132	132	132	132	132	132	132	132
	6	3560	Digital alarm input	133	133	133	133	133	133	133	133
	7										
	8										
	9										
	10										
	11										
	12										
	13										
	14										
	15										
1012	**Analogue input alarm**										
	0	4000	4-20mA	91.1	91.1	91.1	91.1	91.1	91.1	91.1	91.1
	1	4010	4-20mA	91.2	91.2	91.2	91.2	91.2	91.2	91.2	91.2
	2	4020	Wire failure analogue	91	91	91	91	91	91	91	91

Address	Bit	Channel	Content	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
	3	4030	4-20mA	93.1	93.1	93.1	93.1	93.1	93.1	93.1	93.1
	4	4040	4-20mA	93.2	93.2	93.2	93.2	93.2	93.2	93.2	93.2
	5	4050	Wire failure analogue	93	93	93	93	93	93	93	93
	6	4060	4-20mA	95.1	95.1	95.1	95.1	95.1	95.1	95.1	95.1
	7	4070	4-20mA	95.2	95.2	95.2	95.2	95.2	95.2	95.2	95.2
	8	4080	Wire failure analogue	95	95	95	95	95	95	95	95
	9	4090	4-20mA	97.1	97.1	97.1	97.1	97.1	97.1	97.1	97.1
	10	4100	4-20mA	97.2	97.2	97.2	97.2	97.2	97.2	97.2	97.2
	11	4110	Wire failure analogue	97	97	97	97	97	97	97	97
	12										
	13										
	14										
	15										
1013	**Multi-functional input**										
	0	4120	4-20mA	102.1	102.1	102.1	102.1	102.1	102.1	102.1	102.1
	1	4130	4-20mA	102.2	102.2	102.2	102.2	102.2	102.2	102.2	102.2
	0	4140	V DC	102.1	102.1	102.1	102.1	102.1	102.1	102.1	102.1
	1	4150	V DC	102.2	102.2	102.2	102.2	102.2	102.2	102.2	102.2
	0	4160	PT	102.1	102.1	102.1	102.1	102.1	102.1	102.1	102.1
	1	4170	PT	102.2	102.2	102.2	102.2	102.2	102.2	102.2	102.2
	0	4180	VDO oil	102.1	102.1	102.1	102.1	102.1	102.1	102.1	102.1

Address	Bit	Channel	Content	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
	1	4190	VDO oil	102.2	102.2	102.2	102.2	102.2	102.2	102.2	102.2
	0	4200	VDO water	102.1	102.1	102.1	102.1	102.1	102.1	102.1	102.1
	1	4210	VDO water	102.2	102.2	102.2	102.2	102.2	102.2	102.2	102.2
	0	4220	VDO fuel	102.1	102.1	102.1	102.1	102.1	102.1	102.1	102.1
	1	4230	VDO fuel	102.2	102.2	102.2	102.2	102.2	102.2	102.2	102.2
	2	4240	W. fail.	102	102	102	102	102	102	102	102
	3	4250	4-20mA	105.1	105.1	105.1	105.1	105.1	105.1	105.1	105.1
	4	4260	4-20mA	105.2	105.2	105.2	105.2	105.2	105.2	105.2	105.2
	3	4270	V DC	105.1	105.1	105.1	105.1	105.1	105.1	105.1	105.1
	4	4280	V DC	105.2	105.2	105.2	105.2	105.2	105.2	105.2	105.2
	3	4290	PT	105.1	105.1	105.1	105.1	105.1	105.1	105.1	105.1
	4	4300	PT	105.2	105.2	105.2	105.2	105.2	105.2	105.2	105.2
	3	4310	VDO oil	105.1	105.1	105.1	105.1	105.1	105.1	105.1	105.1
	4	4320	VDO oil	105.2	105.2	105.2	105.2	105.2	105.2	105.2	105.2
	3	4330	VDO water	105.1	105.1	105.1	105.1	105.1	105.1	105.1	105.1
	4	4340	VDO water	105.2	105.2	105.2	105.2	105.2	105.2	105.2	105.2
	3	4350	VDO fuel	105.1	105.1	105.1	105.1	105.1	105.1	105.1	105.1
	4	4360	VDO fuel	105.2	105.2	105.2	105.2	105.2	105.2	105.2	105.2
	5	4370	W. fail.	105	105	105	105	105	105	105	105
	6	4380	4-20mA	108.1	108.1	108.1	108.1	108.1	108.1	108.1	108.1
	7	4390	4-20mA	108.2	108.2	108.2	108.2	108.2	108.2	108.2	108.2

Address	Bit	Channel	Content	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
	6	4400	V DC	108.1	108.1	108.1	108.1	108.1	108.1	108.1	108.1
	7	4410	V DC	108.2	108.2	108.2	108.2	108.2	108.2	108.2	108.2
	6	4420	PT	108.1	108.1	108.1	108.1	108.1	108.1	108.1	108.1
	7	4430	PT	108.2	108.2	108.2	108.2	108.2	108.2	108.2	108.2
	6	4440	VDO oil	108.1	108.1	108.1	108.1	108.1	108.1	108.1	108.1
	7	4450	VDO oil	108.2	108.2	108.2	108.2	108.2	108.2	108.2	108.2
	6	4460	VDO water	108.1	108.1	108.1	108.1	108.1	108.1	108.1	108.1
	7	4470	VDO water	108.2	108.2	108.2	108.2	108.2	108.2	108.2	108.2
	6	4480	VDO fuel	108.1	108.1	108.1	108.1	108.1	108.1	108.1	108.1
	7	4490	VDO fuel	108.2	108.2	108.2	108.2	108.2	108.2	108.2	108.2
	8	4500	W. fail.	108	108	108	108	108	108	108	108
	Analogue input alarm										
	9	4510	Oversp. 1	X			X	X	X		
	10	4520	Oversp. 2	X			X	X	X		
	11	4530	Crank failure	X			X	X			
	12	4540	Running feedback failure	X			X	X	X		
	13	4550	MPU wire failure	X			X	X	X		
	14	4560	Hz/V failure	X			X	X	X	X	
	15	4570	Start failure	X			X	X			
1014	0	4580	Stop failure	X			X	X			
	1	4960	U< aux. term.	1	1	1	1	1	1	1	1

Address	Bit	Channel	Content	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
	2	4970	U> aux. term.	1	1	1	1	1	1	1	1
	3	4980	U< aux. term.	98	98	98	98	98	98	98	98
	4	4990	U> aux. term.	98	98	98	98	98	98	98	98
	5										
	6										
	7										
	8										
	9										
	10										
	11										
	12										
	13										
	14										
	15										
1015	0	6110	Service timer 1	X			X	X	X		
	1	6120	Service timer 2	X			X	X	X		
	2	6270	Stop coil wire break	X			X	X			
	3	6280	Internal communication failure	X	X	X	X	X	X	X	X
	4	6330	Engine heater 1	X							
	5	6410	Battery test	X							
	6	6440	Battery asymmetry 1	X	X	X					

Address	Bit	Channel	Content	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
	7	6450	Battery asymmetry 2	X	X	X					
	8	6470	Max. ventilation 1	X							
	9	6480	Max. ventilation 2	X							
	10	6500	Blk. swbd. error	X							
	11	6510	Stp. swbd. error	X							
	12	6540	Unit not in Auto	X	X	X					
	13	6550	Fuel pump logic	X							
	14										
	15										
1016	**Output**										
	0	5000	Relay	5	5	5	5	5	5	5	5
	1	5010	Relay	8	8	8	8	8	8	8	8
	2	5020	Relay	11	11	11	11	11	11	11	11
	3	5030	Relay	14	14	14	14	14	14	14	14
	4	5040	Relay	17	17	17	17	17	17	17	17
	5	5050	Relay	T20	T20	T20	T20	T20	T20	T20	T20
	6	5060	Relay	T21	T21	T21	T21	T21	T21	T21	T21
	7	5070	Relay	29	29	29	29	29	29	29	29
	8	5080	Relay	31	31	31	31	31	31	31	31
	9	5090	Relay	33	33	33	33	33	33	33	33
	10	5100	Relay	35	35	35	35	35	35	35	35

Address	Bit	Channel	Content	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
	11	5110	Relay	57	57	57	57	57	57	57	57
	12	5120	Relay	59	59	59	59	59	59	59	59
	13	5130	Relay	61	61	61	61	61	61	61	61
	14	5140	Relay	63	63	63	63	63	63	63	63
	15										
1017	0	5150	Relay	65	65	65	65	65	65	65	65
	1	5160	Relay	67	67	67	67	67	67	67	67
	2	5170	Relay	69	69	69	69	69	69	69	69
	3	5180	Relay	71	71	71	71	71	71	71	71
	4	5190	Relay	90	90	90	90	90	90	90	90
	5	5200	Relay	92	92	92	92	92	92	92	92
	6	5210	Relay	94	94	94	94	94	94	94	94
	7	5220	Relay	96	96	96	96	96	96	96	96
	8	5230	Relay	126	126	126	126	126	126	126	126
	9	5240	Relay	128	128	128	128	128	128	128	128
	10	5250	Relay	130	130	130	130	130	130	130	130
	11	5260	Relay	132	132	132	132	132	132	132	132
	12		Run. coil relay	X			X	X			
	13		Start prepare	X			X	X			
	14		Start relay	X			X	X			
	15		Stop coil relay	X			X	X			

Address	Bit	Channel	Content	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
1018	**Status**										
	0		Mains failure	X	X						
			Main busbar failure					X			
	1		MB pos. ON	X	X						
			SGB pos. ON						X		
			SCB pos. ON							X	
			TB pos. ON					X			
	2		DG ramp down	X			X	X			
	3		Start regulation	X			X	X			
	4		GB pos. ON	X			X	X			
			TB pos. ON		X						
			BTB pos. ON			X					X
	5		GB synchronising	X			X	X			
			TB synchronising		X						
			BTB synchronising			X					X
	6		Engine running	X			X	X	X		
	7		Running detect. timer expired	X			X	X	X		
	8	4560	DG Hz/V OK, timer expired	X			X	X			
	9	6410	Battery test	X							
	10		Printing log	X	X	X					
	11		GB position OFF	X			X	X			

Address	Bit	Channel	Content	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
			TB position OFF		X						
			BTB position OFF			X					X
	12		MB position OFF	X	X						
			SGB position OFF						X		
			SCB position OFF							X	
			TB position OFF								X
	13		BB Hz/V OK	X	X	X	X	X	X	X	X
	14		MB synchronising	X							
	15										
1019	**General/modes**										
	0		Block mode	X		X					
	1		Manual mode	X							
			SWBD Mode				X	X	X	X	X
	2		Semi auto mode	X	X	X	X	X			
	3		Auto mode	X	X	X	X	X			
	4		Test	X	X			X			
	5		Island	X	X						
	6		AMF	X	X						
	7		Peak shaving	X	X						
	8		Fixed power	X	X						

Address	Bit	Channel	Content	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
	9		Mains power export	X	X						
	10		Load takeover	X	X						
	11		Power management	X		X					
	11		Gen-set group		X						
	12		DG supply						X	X	
	13		SG/SC supply						X	X	
	14										
	15		AMF active	X	X						
	Engine Interface Communication alarm										
1020	0	7570	Communication error	X			X	X			
	1	7580	Warning	X			X	X			
	2	7590	Shutdown	X			X	X			
	3	7600	Overspeed	X			X	X			
	4	7610	Cool water temp. high 1	X			X	X			
	5	7620	Cool water temp. high 2	X			X	X			
	6	7630	Oil pressure low 1	X			X	X			
	7	7640	Oil pressure low 2	X			X	X			
	8										
	9										
	10										
	11										

Address	Bit	Channel	Content	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
	12										
	13										
	14										
	15										
1021 - 1024			See H5/H7 manual								
1025			Reserved								
1026	**Scania KWP 2000**										
	0		Overreving	X			X	X			
	1		Speed sensor 1	X			X	X			
	2		Speed sensor 2	X			X	X			
	3		Water temp. sensor	X			X	X			
	4		Charge air temp. sensor	X			X	X			
	5		Charge air pressure sensor	X			X	X			
	6		Oil temp. sensor	X			X	X			
	7		Oil pressure sensor	X			X	X			
	8		Fault in cor.	X			X	X			
	9		Throttle pedal	X			X	X			
	10		Emergency stop override	X			X	X			
	11		Oil pressure prot.	X			X	X			

Address	Bit	Channel	Content	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
	12		Wrong parameter	X			X	X			
	13		Battery voltage	X			X	X			
	14		Oil pressure prot.	X			X	X			
	15		Emergency stop cor.	X			X	X			
1027	0		CAN cir. defect	X			X	X			
	1		CAN mess. DLN1	X			X	X			
	2		Wrong CAN version	X			X	X			
	3		Un. inj. cyl. 1	X			X	X			
	4		Un. inj. cyl. 2	X			X	X			
	5		Un. inj. cyl. 3	X			X	X			
	6		Un. inj. cyl. 4	X			X	X			
	7		Un. inj. cyl. 5	X			X	X			
	8		Un. inj. cyl. 6	X			X	X			
	9		Un. inj. cyl. 7	X			X	X			
	10		Un. inj. cyl. 8	X			X	X			
	11		Extra ana. inp.	X			X	X			
	12		System shutdown	X			X	X			
	13		Coola. L. prot.	X			X	X			
	14		HW watchdog	X			X	X			
	15		Fault in RAM	X			X	X			
1028	0		Seal	X			X	X			

Address	Bit	Channel	Content	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
	1		Coola. shut OFF	X			X	X			
	2		Overheat prot.	X			X	X			
	3		Fault in TPU	X			X	X			
	4										
	5										
	6										
	7										
	8										
	9										
	10										
	11										
	12										
	13										
	14										
	15										
Re-ser-ved											

Address	Bit	Channel	Function	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
1031	**Internal communications**										
	0										
	1		CAN 1 missing ID	1	1	1	1	1	1	1	1
	2		CAN 1 missing ID	2	2	2	2	2	2	2	2
	3		CAN 1 missing ID	3	3	3	3	3	3	3	3
	4		CAN 1 missing ID	4	4	4	4	4	4	4	4
	5		CAN 1 missing ID	5	5	5	5	5	5	5	5
	6		CAN 1 missing ID	6	6	6	6	6	6	6	6
	7		CAN 1 missing ID	7	7	7	7	7	7	7	7
	8		CAN 1 missing ID	8	8	8	8	8	8	8	8
	9		CAN 1 missing ID	9	9	9	9	9	9	9	9
	10		CAN 1 missing ID	10	10	10	10	10	10	10	10
	11		CAN 1 missing ID	11	11	11	11	11	11	11	11
	12		CAN 1 missing ID	12	12	12	12	12	12	12	12
	13		CAN 1 missing ID	13	13	13	13	13	13	13	13
	14		CAN 1 missing ID	14	14	14	14	14	14	14	14
	15		CAN 1 missing ID	15	15	15	15	15	15	15	15
1032	0		CAN 1 missing ID	16	16	16	16	16	16	16	16
	1										
	2		CAN 2 missing ID	1	1	1	1	1	1	1	1
	3		CAN 2 missing ID	2	2	2	2	2	2	2	2
	4		CAN 2 missing ID	3	3	3	3	3	3	3	3
	5		CAN 2 missing ID	4	4	4	4	4	4	4	4
	6		CAN 2 missing ID	5	5	5	5	5	5	5	5

Address	Bit	Channel	Function	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
	7		CAN 2 missing ID	6	6	6	6	6	6	6	6
	8		CAN 2 missing ID	7	7	7	7	7	7	7	7
	9		CAN 2 missing ID	8	8	8	8	8	8	8	8
	10		CAN 2 missing ID	9	9	9	9	9	9	9	9
	11		CAN 2 missing ID	10	10	10	10	10	10	10	10
	12		CAN 2 missing ID	11	11	11	11	11	11	11	11
	13		CAN 2 missing ID	12	12	12	12	12	12	12	12
	14		CAN 2 missing ID	13	13	13	13	13	13	13	13
	15		CAN 2 missing ID	14	14	14	14	14	14	14	14
1033	0		CAN 2 missing ID	15	15	15	15	15	15	15	15
	1		CAN 2 missing ID	16	16	16	16	16	16	16	16
	2		Communication error ext.	X	X	X	X	X	X	X	X
	3										
	4										
	5										
	6										
	7										
	8										
	9										
	10										
	11										
	12										
	13										
	14										
	15										

Address	Bit	Channel	Function	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
1034	0										
	1		Ext. comm. errror ID	1	1	1	1	1	1	1	1
	2		Ext. comm. errror ID	2	2	2	2	2	2	2	2
	3		Ext. comm. errror ID	3	3	3	3	3	3	3	3
	4		Ext. comm. errror ID	4	4	4	4	4	4	4	4
	5		Ext. comm. errror ID	5	5	5	5	5	5	5	5
	6		Ext. comm. errror ID	6	6	6	6	6	6	6	6
	7		Ext. comm. errror ID	7	7	7	7	7	7	7	7
	8		Ext. comm. errror ID	8	8	8	8	8	8	8	8
	9		Ext. comm. errror ID	9	9	9	9	9	9	9	9
	10		Ext. comm. errror ID	10	10	10	10	10	10	10	10
	11		Ext. comm. errror ID	11	11	11	11	11	11	11	11
	12		Ext. comm. errror ID	12	12	12	12	12	12	12	12
	13		Ext. comm. errror ID	13	13	13	13	13	13	13	13
	14		Ext. comm. errror ID	14	14	14	14	14	14	14	14
	15		Ext. comm. errror ID	15	15	15	15	15	15	15	15
1035	0		Ext. comm. errror ID	16	16	16	16	16	16	16	16
	1										
	2										
	3										
	4										
	5										
	6										
	7										
	8										

Address	Bit	Channel	Function	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
	9										
	10										
	11										
	12										
	13										
	14										
	15										
1036	**External inputs**										
	0	12000	Analogue in. 1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
	1	12010	Analogue in. 1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	2	12020	W. fail. analogue 1	1	1	1	1	1	1	1	1
	3	12030	Analogue in. 2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	4	12040	Analogue in. 2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
	5	12050	W. fail. analogue 2	2	2	2	2	2	2	2	2
	6	12060	Analogue in. 3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
	7	12070	Analogue in. 3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2
	8	12080	W. fail. analogue 3	3	3	3	3	3	3	3	3
	9	12090	Analogue in. 4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
	10	12100	Analogue in. 4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2
	11	12110	W. fail. analogue 4	4	4	4	4	4	4	4	4
	12	12120	Analogue in. 5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1
	13	12130	Analogue in. 5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2
	14	12140	W. fail. analogue 5	5	5	5	5	5	5	5	5
	15	12150	Analogue in. 6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1
1037	0	12160	Analogue in. 6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2

Address	Bit	Channel	Function	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
	1	12170	W. fail. analogue 6	6	6	6	6	6	6	6	6
	2	12180	Analogue in. 7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1
	3	12190	Analogue in. 7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2
	4	12200	W. fail. analogue 7	7	7	7	7	7	7	7	7
	5	12210	Analogue in. 8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1
	6	12220	Analogue in. 8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2
	7	12230	W. fail. analogue 8	8	8	8	8	8	8	8	8
	8										
	9										
	10										
	11										
	12										
	13										
	14										
	15										
1038	0	12540	External digital input	1	1	1	1	1	1	1	1
	1	12550	External digital input	2	2	2	2	2	2	2	2
	2	12560	External digital input	3	3	3	3	3	3	3	3
	3	12570	External digital input	4	4	4	4	4	4	4	4
	4	12580	External digital input	5	5	5	5	5	5	5	5
	5	12590	External digital input	6	6	6	6	6	6	6	6
	6	12600	External digital input	7	7	7	7	7	7	7	7
	7	12610	External digital input	8	8	8	8	8	8	8	8
	8	12620	External digital input	9	9	9	9	9	9	9	9
	9	12630	External digital input	10	10	10	10	10	10	10	10

Address	Bit	Channel	Function	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
	10	12640	External digital input	11	11	11	11	11	11	11	11
	11	12650	External digital input	12	12	12	12	12	12	12	12
	12	12660	External digital input	13	13	13	13	13	13	13	13
	13	12670	External digital input	14	14	14	14	14	14	14	14
	14	12680	External digital input	15	15	15	15	15	15	15	15
	15	12690	External digital input	16	16	16	16	16	16	16	16
1039	0	12790	External digital output	1	1	1	1	1	1	1	1
	1	12800	External digital output	2	2	2	2	2	2	2	2
	2	12810	External digital output	3	3	3	3	3	3	3	3
	3	12820	External digital output	4	4	4	4	4	4	4	4
	4	12830	External digital output	5	5	5	5	5	5	5	5
	5	12840	External digital output	6	6	6	6	6	6	6	6
	6	12850	External digital output	7	7	7	7	7	7	7	7
	7	12860	External digital output	8	8	8	8	8	8	8	8
	8	12870	External digital output	9	9	9	9	9	9	9	9
	9	12880	External digital output	10	10	10	10	10	10	10	10
	10	12890	External digital output	11	11	11	11	11	11	11	11
	11	12900	External digital output	12	12	12	12	12	12	12	12
	12	12910	External digital output	13	13	13	13	13	13	13	13
	13	12920	External digital output	14	14	14	14	14	14	14	14
	14	12930	External digital output	15	15	15	15	15	15	15	15
	15	12940	External digital output	16	16	16	16	16	16	16	16
1040	0		CAN 1 missing ID no.	1	1	1	1	1	1	1	1
	1		CAN 1 missing ID no.	2	2	2	2	2	2	2	2
	2		CAN 1 missing ID no.	3	3	3	3	3	3	3	3

Address	Bit	Channel	Function	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
	3		CAN 1 missing ID no.	4	4	4	4	4	4	4	4
	4		CAN 1 missing ID no.	5	5	5	5	5	5	5	5
	5		CAN 1 missing ID no.	6	6	6	6	6	6	6	6
	6		CAN 1 missing ID no.	7	7	7	7	7	7	7	7
	7		CAN 1 missing ID no.	8	8	8	8	8	8	8	8
	8		CAN 1 missing ID no.	9	9	9	9	9	9	9	9
	9		CAN 1 missing ID no.	10	10	10	10	10	10	10	10
	10		CAN 1 missing ID no.	11	11	11	11	11	11	11	11
	11		CAN 1 missing ID no.	12	12	12	12	12	12	12	12
	12		CAN 1 missing ID no.	13	13	13	13	13	13	13	13
	13		CAN 1 missing ID no.	14	14	14	14	14	14	14	14
	14		CAN 1 missing ID no.	15	15	15	15	15	15	15	15
	15		CAN 1 missing ID no.	16	16	16	16	16	16	16	16
1041	0		CAN 1 missing ID no.	17	17	17	17	17	17	17	17
	1		CAN 1 missing ID no.	18	18	18	18	18	18	18	18
	2		CAN 1 missing ID no.	19	19	19	19	19	19	19	19
	3		CAN 1 missing ID no.	20	20	20	20	20	20	20	20
	4		CAN 1 missing ID no.	21	21	21	21	21	21	21	21
	5		CAN 1 missing ID no.	22	22	22	22	22	22	22	22
	6		CAN 1 missing ID no.	23	23	23	23	23	23	23	23
	7		CAN 1 missing ID no.	24	24	24	24	24	24	24	24
	8		CAN 1 missing ID no.	25	25	25	25	25	25	25	25
	9		CAN 1 missing ID no.	26	26	26	26	26	26	26	26
	10		CAN 1 missing ID no.	27	27	27	27	27	27	27	27
	11		CAN 1 missing ID no.	28	28	28	28	28	28	28	28

Address	Bit	Channel	Function	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
	12		CAN 1 missing ID no.	29	29	29	29	29	29	29	29
	13		CAN 1 missing ID no.	30	30	30	30	30	30	30	30
	14		CAN 1 missing ID no.	31	31	31	31	31	31	31	31
	15		CAN 1 missing ID no.	32	32	32	32	32	32	32	32
1042	0		CAN 1 missing ID no.	33	33	33	33	33	33	33	33
	1		CAN 1 missing ID no.	34	34	34	34	34	34	34	34
	2		CAN 1 missing ID no.	35	35	35	35	35	35	35	35
	3		CAN 1 missing ID no.	36	36	36	36	36	36	36	36
	4		CAN 1 missing ID no.	37	37	37	37	37	37	37	37
	5		CAN 1 missing ID no.	38	38	38	38	38	38	38	38
	6		CAN 1 missing ID no.	39	39	39	39	39	39	39	39
	7		CAN 1 missing ID no.	40	40	40	40	40	40	40	40
	8										
	9										
	10										
	11										
	12										
	13										
	14										
	15										
1043	0		CAN 2 missing ID no.	1	1	1	1	1	1	1	1
	1		CAN 2 missing ID no.	2	2	2	2	2	2	2	2
	2		CAN 2 missing ID no.	3	3	3	3	3	3	3	3
	3		CAN 2 missing ID no.	4	4	4	4	4	4	4	4
	4		CAN 2 missing ID no.	5	5	5	5	5	5	5	5

Address	Bit	Channel	Function	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
	5		CAN 2 missing ID no.	6	6	6	6	6	6	6	6
	6		CAN 2 missing ID no.	7	7	7	7	7	7	7	7
	7		CAN 2 missing ID no.	8	8	8	8	8	8	8	8
	8		CAN 2 missing ID no.	9	9	9	9	9	9	9	9
	9		CAN 2 missing ID no.	10	10	10	10	10	10	10	10
	10		CAN 2 missing ID no.	11	11	11	11	11	11	11	11
	11		CAN 2 missing ID no.	12	12	12	12	12	12	12	12
	12		CAN 2 missing ID no.	13	13	13	13	13	13	13	13
	13		CAN 2 missing ID no.	14	14	14	14	14	14	14	14
	14		CAN 2 missing ID no.	15	15	15	15	15	15	15	15
	15		CAN 2 missing ID no.	16	16	16	16	16	16	16	16
1044	0		CAN 2 missing ID no.	17	17	17	17	17	17	17	17
	1		CAN 2 missing ID no.	18	18	18	18	18	18	18	18
	2		CAN 2 missing ID no.	19	19	19	19	19	19	19	19
	3		CAN 2 missing ID no.	20	20	20	20	20	20	20	20
	4		CAN 2 missing ID no.	21	21	21	21	21	21	21	21
	5		CAN 2 missing ID no.	22	22	22	22	22	22	22	22
	6		CAN 2 missing ID no.	23	23	23	23	23	23	23	23
	7		CAN 2 missing ID no.	24	24	24	24	24	24	24	24
	8		CAN 2 missing ID no.	25	25	25	25	25	25	25	25
	9		CAN 2 missing ID no.	26	26	26	26	26	26	26	26
	10		CAN 2 missing ID no.	27	27	27	27	27	27	27	27
	11		CAN 2 missing ID no.	28	28	28	28	28	28	28	28
	12		CAN 2 missing ID no.	29	29	29	29	29	29	29	29
	13		CAN 2 missing ID no.	30	30	30	30	30	30	30	30

Address	Bit	Channel	Function	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
	14		CAN 2 missing ID no.	31	31	31	31	31	31	31	31
	15		CAN 2 missing ID no.	32	32	32	32	32	32	32	32
1045	0		CAN 2 missing ID no.	33	33	33	33	33	33	33	33
	1		CAN 2 missing ID no.	34	34	34	34	34	34	34	34
	2		CAN 2 missing ID no.	35	35	35	35	35	35	35	35
	3		CAN 2 missing ID no.	36	36	36	36	36	36	36	36
	4		CAN 2 missing ID no.	37	37	37	37	37	37	37	37
	5		CAN 2 missing ID no.	38	38	38	38	38	38	38	38
	6		CAN 2 missing ID no.	39	39	39	39	39	39	39	39
	7		CAN 2 missing ID no.	40	40	40	40	40	40	40	40
	8										
	9										
	10										
	11										
	12										
	13										
	14										
	15										
1046	0	4800	4-20 mA alarm no.	127.1	127.1	127.1	127.1	127.1	127.1	127.1	127.1
	1	4810	4-20 mA alarm no.	127.2	127.2	127.2	127.2	127.2	127.2	127.2	127.2
	2	4820	Wire fail analogue input	127	127	127	127	127	127	127	127
	3	4830	4-20 mA alarm no.	129.1	129.1	129.1	129.1	129.1	129.1	129.1	129.1
	4	4840	4-20 mA alarm no.	129.2	129.2	129.2	129.2	129.2	129.2	129.2	129.2
	5	4850	Wire fail analogue input	129	129	129	129	129	129	129	129
	6	4860	4-20 mA alarm no.	131.1	131.1	131.1	131.1	131.1	131.1	131.1	131.1

Address	Bit	Channel	Function	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
	7	4870	4-20 mA alarm no.	131.2	131.2	131.2	131.2	131.2	131.2	131.2	131.2
	8	4880	Wire fail analogue input	131	131	131	131	131	131	131	131
	9	4890	4-20 mA alarm no.	133.1	133.1	133.1	133.1	133.1	133.1	133.1	133.1
	10	4900	4-20 mA alarm no.	133.2	133.2	133.2	133.2	133.2	133.2	133.2	133.2
	11	4910	Wire fail analogue input	133	133	133	133	133	133	133	133
	12										
	13										
	14										
	15										
1047	0		GG group 1 missing		X						
	1		GG group 2 missing		X						
	2		GG group 3 missing		X						
	3		GG group 4 missing		X						
	4		GG group 5 missing		X						
	5		GG group 6 missing		X						
	6		GG group 7 missing		X						
	7		GG group 8 missing		X						
	8		GG group 9 missing		X						
	9		GG group 10 missing		X						
	10		GG group 11 missing		X						
	11		GG group 12 missing		X						
	12		GG group 13 missing		X						
	13		GG group 14 missing		X						
	14		GG group 15 missing		X						
	15		GG group 16 missing		X						

Address	Bit	Channel	Function	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
1048	0		GG mains 17 missing		X						
	1		GG mains 18 missing		X						
	2		GG mains 19 missing		X						
	3		GG mains 20 missing		X						
	4		GG mains 1 missing		X						
	5		GG mains 22 missing		X						
	6		GG mains 23 missing		X						
	7		GG mains 24 missing		X						
	8		GG mains 25 missing		X						
	9		GG mains 26 missing		X						
	10		GG mains 27 missing		X						
	11		GG mains 28 missing		X						
	12		GG mains 29 missing		X						
	13		GG mains 30 missing		X						
	14		GG mains 31 missing		X						
	15		GG mains 32 missing		X						
1049			Reserved								
1050-1369	0		Not used								

Power management measurement table (read only) (function code 04h)

Addr.	Bit	Function	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
AGC: Option G5, PPM: Standard										
1500		Total power	X			X	X	X	X	X
1501		Available power	X			X	X	X	X	X
1502		Total nominal power	X			X	X	X	X	X
1503		Total gen-set power	X			X	X	X	X	X
1504		Total reactive power	X			X	X	X	X	X
1505		Number of gen-sets	X			X	X	X	X	X
1506		Mains selection	X							
1507		Load dependent stop	X			X				
1508		Load dependent start	X			X				
1509		Stop gen-set calculation	X			X				
1510		Nominal power gen-set	1			1				
1511		Nominal power gen-set	2			2				
1512		Nominal power gen-set	3			3				
1513		Nominal power gen-set	4			4				
1514		Nominal power gen-set	5			5				
1515		Nominal power gen-set	6			6				
1516		Nominal power gen-set	7			7				
1517		Nominal power gen-set	8			8				
1518		Nominal power gen-set	9			9				
1519		Nominal power gen-set	10			10				
1520		Nominal power gen-set	11			11				

Addr.	Bit	Function	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
1521		Nominal power gen-set	12			12				
1522		Nominal power gen-set	13			13				
1523		Nominal power gen-set	14			14				
1524		Nominal power gen-set	15			15				
1525		Nominal power gen-set	16			16				
1526		Power gen-set	1			1				
1527		Power gen-set	2			2				
1528		Power gen-set	3			3				
1529		Power gen-set	4			4				
1530		Power gen-set	5			5				
1531		Power gen-set	6			6				
1532		Power gen-set	7			7				
1533		Power gen-set	8			8				
1534		Power gen-set	9			9				
1535		Power gen-set	10			10				
1536		Power gen-set	11			11				
1537		Power gen-set	12			12				
1538		Power gen-set	13			13				
1539		Power gen-set	14			14				
1540		Power gen-set	15			15				
1541		Power gen-set	16			16				
1542		Reactive power gen-set	1			1				
1543		Reactive power gen-set	2			2				
1544		Reactive power gen-set	3			3				
1545		Reactive power gen-set	4			4				

Addr.	Bit	Function	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
1546		Reactive power gen-set	5			5				
1547		Reactive power gen-set	6			6				
1548		Reactive power gen-set	7			7				
1549		Reactive power gen-set	8			8				
1550		Reactive power gen-set	9			9				
1551		Reactive power gen-set	10			10				
1552		Reactive power gen-set	11			11				
1553		Reactive power gen-set	12			12				
1554		Reactive power gen-set	13			13				
1555		Reactive power gen-set	14			14				
1556		Reactive power gen-set	15			15				
1557		Reactive power gen-set	16			16				
1558										
1559										
1560		Power, mains 1A	X							
1561		Power, mains 1B	X							
1562		Power, mains 2A	X							
1563		Power, mains 2B	X							
1564										
1565		Reactive power mains 1A	X							
1566		Reactive power mains 1B	X							
1567		Reactive power mains 2A	X							
1568		Reactive power mains 2B	X							
1569		Power mains 17	X							
		Power shaft 17						X		

Addr.	Bit	Function	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
		Power shore 17							X	
1570		Power mains 18	X							
		Power shaft 18						X		
		Power shore 18							X	
1571		Power mains 19	X							
		Power shaft 19						X		
		Power shore 19							X	
1572		Power mains 20	X							
		Power shaft 20						X		
		Power shore 20							X	
1573		Power mains 21	X							
1574		Power mains 22	X							
1575		Power mains 23	X							
1576		Power mains 24	X							
1577		Power mains 25	X							
1578		Power mains 26	X							
1579		Power mains 27	X							
1580		Power mains 28	X							
1581		Power mains 29	X							
1582		Power mains 30	X							
1583		Power mains 31	X							
1584		Power mains 32	X							
1585		Reactive power mains 17	X							
		Reactive power shaft 17						X		
		Reactive power shore 17							X	

Addr.	Bit	Function	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
1586		Reactive power mains 18	X							
		Reactive power shaft 18						X		
		Reactive power shore 18							X	
1587		Reactive power mains 19	X							
		Reactive power shaft 19						X		
		Reactive power shore 19							X	
1588		Reactive power mains 20	X							
		Reactive power shaft 20						X		
		Reactive power shore 20							X	
1589		Reactive power mains 21	X							
1590		Reactive power mains 22	X							
1591		Reactive power mains 23	X							
1592		Reactive power mains 24	X							
1593		Reactive power mains 25	X							
1594		Reactive power mains 26	X							
1595		Reactive power mains 27	X							
1596		Reactive power mains 28	X							
1597		Reactive power mains 29	X							
1598		Reactive power mains 30	X							
1599		Reactive power mains 31	X							
1600		Reactive power mains 32	X							
1601		Power bus tie breaker 33	X							X
1602		Power bus tie breaker 34	X							X
1603		Power bus tie breaker 35	X							X
1604		Power bus tie breaker 36	X							X

Addr.	Bit	Function	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
1605		Power bus tie breaker 37	X							X
1606		Power bus tie breaker 38	X							X
1607		Power bus tie breaker 39	X							X
1608		Power bus tie breaker 40	X							X
1609		Reactive power bus tie breaker 33	X							X
1610		Reactive power bus tie breaker 34	X							X
1611		Reactive power bus tie breaker 35	X							X
1612		Reactive power bus tie breaker 36	X							X
1613		Reactive power bus tie breaker 37	X							X
1614		Reactive power bus tie breaker 38	X							X
1615		Reactive power bus tie breaker 39	X							X
1616		Reactive power bus tie breaker 40	X							X
1617		Plant mode mains 17	X							
1618		Plant mode mains 18	X							
1619		Plant mode mains 19	X							
1620		Plant mode mains 20	X							
1621		Plant mode mains 21	X							
1622		Plant mode mains 22	X							
1623		Plant mode mains 23	X							
1624		Plant mode mains 24	X							
1625		Plant mode mains 25	X							
1626		Plant mode mains 26	X							
1627		Plant mode mains 27	X							
1628		Plant mode mains 28	X							
1629		Plant mode mains 29	X							

Addr.	Bit	Function	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
1630		Plant mode mains 30	X							
1631		Plant mode mains 31	X							
1632		Plant mode mains 32	X							
1633		Bus power mains 17	X							
1634		Bus power mains 18	X							
1635		Bus power mains 19	X							
1636		Bus power mains 20	X							
1637		Bus power mains 21	X							
1638		Bus power mains 22	X							
1639		Bus power mains 23	X							
1640		Bus power mains 24	X							
1641		Bus power mains 25	X							
1642		Bus power mains 26	X							
1643		Bus power mains 27	X							
1644		Bus power mains 28	X							
1645		Bus power mains 29	X							
1646		Bus power mains 30	X							
1647		Bus power mains 31	X							
1648		Bus power mains 32	X							
1649	0	ID 17 mains transducer-configured	X	X	X					
	1	ID 18 mains transducer-configured	X	X	X					
	2	ID 19 mains transducer-configured	X	X	X					
	3	ID 20 mains transducer-configured	X	X	X					
	4	ID 21 mains transducer-configured	X	X	X					
	5	ID 22 mains transducer-configured	X	X	X					

Addr.	Bit	Function	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
	6	ID 23 mains transducer-configured	X	X	X					
	7	ID 24 mains transducer-configured	X	X	X					
	8	ID 25 mains transducer-configured	X	X	X					
	9	ID 26 mains transducer-configured	X	X	X					
	10	ID 27 mains transducer-configured	X	X	X					
	11	ID 28 mains transducer-configured	X	X	X					
	12	ID 29 mains transducer-configured	X	X	X					
	13	ID 30 mains transducer-configured	X	X	X					
	14	ID 31 mains transducer-configured	X	X	X					
	15	ID 32 mains transducer-configured	X	X	X					
1650	0	ID 17 TB transducer-configured	X	X	X					
	1	ID 18 TB transducer-configured	X	X	X					
	2	ID 19 TB transducer-configured	X	X	X					
	3	ID 20 TB transducer-configured	X	X	X					
	4	ID 21 TB transducer-configured	X	X	X					
	5	ID 22 TB transducer-configured	X	X	X					
	6	ID 23 TB transducer-configured	X	X	X					
	7	ID 24 TB transducer-configured	X	X	X					
	8	ID 25 TB transducer-configured	X	X	X					
	9	ID 26 TB transducer-configured	X	X	X					
	10	ID 27 TB transducer-configured	X	X	X					
	11	ID 28 TB transducer-configured	X	X	X					
	12	ID 29 TB transducer-configured	X	X	X					
	13	ID 30 TB transducer-configured	X	X	X					
	14	ID 31 TB transducer-configured	X	X	X					

Addr.	Bit	Function	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
	15	ID 32 TB transducer-configured	X	X	X					
1651	0	ID 33 BTB transducer-configured	X	X	X					
	1	ID 34 BTB transducer-configured	X	X	X					
	2	ID 35 BTB transducer-configured	X	X	X					
	3	ID 36 BTB transducer-configured	X	X	X					
	4	ID 37 BTB transducer-configured	X	X	X					
	5	ID 38 BTB transducer-configured	X	X	X					
	6	ID 39 BTB transducer-configured	X	X	X					
	7	ID 40 BTB transducer-configured	X	X	X					
1652	0	ID 33 BTB controlled	X	X	X					
	1	ID 34 BTB controlled	X	X	X					
	2	ID 35 BTB controlled	X	X	X					
	3	ID 36 BTB controlled	X	X	X					
	4	ID 37 BTB controlled	X	X	X					
	5	ID 38 BTB controlled	X	X	X					
	6	ID 39 BTB controlled	X	X	X					
	7	ID 40 BTB controlled	X	X	X					
1653		ID 17 nominal power	X	X	X					
1654		ID 18 nominal power	X	X	X					
1655		ID 19 nominal power	X	X	X					
1656		ID 20 nominal power	X	X	X					
1657		ID 21 nominal power	X	X	X					
1658		ID 22 nominal power	X	X	X					
1659		ID 23 nominal power	X	X	X					
1660		ID 24 nominal power	X	X	X					

Addr.	Bit	Function	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
1661		ID 25 nominal power	X	X	X					
1662		ID 26 nominal power	X	X	X					
1663		ID 27 nominal power	X	X	X					
1664		ID 28 nominal power	X	X	X					
1665		ID 29 nominal power	X	X	X					
1666		ID 30 nominal power	X	X	X					
1667		ID 31 nominal power	X	X	X					
1668		ID 32 nominal power	X	X	X					
1669	0	ID 1 Transducer-configured								
	1	ID 2 Transducer-configured								
	2	ID 3 Transducer-configured								
	3	ID 4 Transducer-configured								
	4	ID 5 Transducer-configured								
	5	ID 6 Transducer-configured								
	6	ID 7 Transducer-configured								
	7	ID 8 Transducer-configured								
	8	ID 9 Transducer-configured								
	9	ID 10 Transducer-configured								
	10	ID 11 Transducer-configured								
	11	ID 12 Transducer-configured								
	12	ID 13 Transducer-configured								
	13	ID 14 Transducer-configured								
	14	ID 15 Transducer-configured								
	15	ID 16 Transducer-configured								
1670		ID 1 Transducer-measured value								

Addr.	Bit	Function	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
1671		ID 2 Transducer- measured value								
1672		ID 3 Transducer-measured value								
1673		ID 4 Transducer-measured value								
1674		ID 5 Transducer-measured value								
1675		ID 6 Transducer-measured value								
1676		ID 7 Transducer-measured value								
1677		ID 8 Transducer-measured value								
1678		ID 9 Transducer-measured value								
1679		ID 10 Transducer-measured value								
1680		ID 11Transducer-measured value								
1681		ID 12 Transducer-measured value								
1682		ID 13 Transducer-measured value								
1683		ID 14 Transducer-measured value								
1684		ID 15 Transducer-measured value								
1685		ID 16 Transducer-measured value								
1649-1699		Reserved								

Power management alarm and status table (read only) (function code 04h)

Addr.	Bit	Function	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
1700		**AGC: Option G5, PPM: Standard**								
	0	TB available	X							
		Shore unit available							X	
	1	Mains unit available	X							
		SG unit available						X		
	2	Any MB pos. ON	X							
		Any SGB/SCB pos ON						X	X	
	3	Any MB pos. OFF	X							
		Any SGB/SCB pos OFF						X	X	
	4	TB pos. ON (Mains Command Unit)	X							
		SCB pos ON							X	
	5	TB pos. OFF (Mains Command Unit)	X							
		SCB pos OFF							X	
	6	Any GB pos. ON	X			X	X	X		
		Any GB pos ON on Main BB								
	7	Any GB pos. OFF	X			X	X	X		
		Any GB pos OFF on Main BB								
	8	Any TB pos. ON	X				X			
	9	Any TB pos. OFF	X				X			
	10	Any BTB pos. ON	X							

Addr.	Bit	Function	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
	10	Any BTB pos. ON in section								X
	11	Any BTB pos. OFF	X							
		Any BTB pos. OFF in section								X
	12									
	13									
	14									
	15									
1701	0	GB pos. ON ID 1	X	X	X	X	X	X	X	X
	1	GB pos. ON ID 2	X	X	X	X	X	X	X	X
	2	GB pos. ON ID 3	X	X	X	X	X	X	X	X
	3	GB pos. ON ID 4	X	X	X	X	X	X	X	X
	4	GB pos. ON ID 5	X	X	X	X	X	X	X	X
	5	GB pos. ON ID 6	X	X	X	X	X	X	X	X
	6	GB pos. ON ID 7	X	X	X	X	X	X	X	X
	7	GB pos. ON ID 8	X	X	X	X	X	X	X	X
	8	GB pos. ON ID 9	X	X	X	X	X	X	X	X
	9	GB pos. ON ID 10	X	X	X	X	X	X	X	X
	10	GB pos. ON ID 11	X	X	X	X	X	X	X	X
	11	GB pos. ON ID 12	X	X	X	X	X	X	X	X
	12	GB pos. ON ID 13	X	X	X	X	X	X	X	X
	13	GB pos. ON ID 14	X	X	X	X	X	X	X	X
	14	GB pos. ON ID 15	X	X	X	X	X	X	X	X
	15	GB pos. ON ID 16	X	X	X	X	X	X	X	X
1702	0	GB pos. OFF ID 1	X	X	X	X	X	X	X	X
	1	GB pos. OFF ID 2	X	X	X	X	X	X	X	X

Addr.	Bit	Function	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
	2	GB pos. OFF ID 3	X	X	X	X	X	X	X	X
	3	GB pos. OFF ID 4	X	X	X	X	X	X	X	X
	4	GB pos. OFF ID 5	X	X	X	X	X	X	X	X
	5	GB pos. OFF ID 6	X	X	X	X	X	X	X	X
	6	GB pos. OFF ID 7	X	X	X	X	X	X	X	X
	7	GB pos. OFF ID 8	X	X	X	X	X	X	X	X
	8	GB pos. OFF ID 9	X	X	X	X	X	X	X	X
	9	GB pos. OFF ID 10	X	X	X	X	X	X	X	X
	10	GB pos. OFF ID 11	X	X	X	X	X	X	X	X
	11	GB pos. OFF ID 12	X	X	X	X	X	X	X	X
	12	GB pos. OFF ID 13	X	X	X	X	X	X	X	X
	13	GB pos. OFF ID 14	X	X	X	X	X	X	X	X
	14	GB pos. OFF ID 15	X	X	X	X	X	X	X	X
	15	GB pos. OFF ID 16	X	X	X	X	X	X	X	X
1703	0	DG Hz/V OK, ID 1	X	X	X	X	X	X	X	X
	1	DG Hz/V OK, ID 2	X	X	X	X	X	X	X	X
	2	DG Hz/V OK, ID 3	X	X	X	X	X	X	X	X
	3	DG Hz/V OK, ID 4	X	X	X	X	X	X	X	X
	4	DG Hz/V OK, ID 5	X	X	X	X	X	X	X	X
	5	DG Hz/V OK, ID 6	X	X	X	X	X	X	X	X
	6	DG Hz/V OK, ID 7	X	X	X	X	X	X	X	X
	7	DG Hz/V OK, ID 8	X	X	X	X	X	X	X	X
	8	DG Hz/V OK, ID 9	X	X	X	X	X	X	X	X
	9	DG Hz/V OK, ID10	X	X	X	X	X	X	X	X
	10	DG Hz/V OK, ID 11	X	X	X	X	X	X	X	X

Addr.	Bit	Function	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
	11	DG Hz/V OK, ID 12	X	X	X	X	X	X	X	X
	12	DG Hz/V OK, ID 13	X	X	X	X	X	X	X	X
	13	DG Hz/V OK, ID 14	X	X	X	X	X	X	X	X
	14	DG Hz/V OK, ID 15	X	X	X	X	X	X	X	X
	15	DG Hz/V OK, ID 16	X	X	X	X	X	X	X	X
1704	0	Mains OK, single mains	X	X	X					
	1	Mains OK, mains 1A	X	X	X					
	2	Mains OK, mains 1B	X	X	X					
	3	Mains OK, mains 2A	X	X	X					
	4	Mains OK, mains 2B	X	X	X					
	5									
	6									
	7									
	8									
	9									
	10									
	11									
	12									
	13									
	14									
	15									
1705	0	Ready for auto start, ID 1	X	X	X	X	X	X	X	X
	1	Ready for auto start, ID 2	X	X	X	X	X	X	X	X
	2	Ready for auto start, ID 3	X	X	X	X	X	X	X	X
	3	Ready for auto start, ID 4	X	X	X	X	X	X	X	X

Addr.	Bit	Function	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
	4	Ready for auto start, ID 5	X	X	X	X	X	X	X	X
	5	Ready for auto start, ID 6	X	X	X	X	X	X	X	X
	6	Ready for auto start, ID 7	X	X	X	X	X	X	X	X
	7	Ready for auto start, ID 8	X	X	X	X	X	X	X	X
	8	Ready for auto start, ID 9	X	X	X	X	X	X	X	X
	9	Ready for auto start, ID 10	X	X	X	X	X	X	X	X
	10	Ready for auto start, ID 11	X	X	X	X	X	X	X	X
	11	Ready for auto start, ID 12	X	X	X	X	X	X	X	X
	12	Ready for auto start, ID 13	X	X	X	X	X	X	X	X
	13	Ready for auto start, ID 14	X	X	X	X	X	X	X	X
	14	Ready for auto start, ID 15	X	X	X	X	X	X	X	X
	15	Ready for auto start, ID 16	X	X	X	X	X	X	X	X
1706	0	Mains not in semi, single mains	X	X	X					
	1	Mains not in semi, mains 1A	X	X	X					
	2	Mains not in semi, mains 1B	X	X	X					
	3	Mains not in semi, mains 2A	X	X	X					
	4	Mains not in semi, mains 2B	X	X	X					
	5									
	6									
	7									
	8									
	9									
	10									
	11									
	12									

Addr.	Bit	Function	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
	13									
	14									
	15									
1707	0	Any alarms, ID 1	X	X	X	X	X	X	X	X
	1	Any alarms, ID 2	X	X	X	X	X	X	X	X
	2	Any alarms, ID 3	X	X	X	X	X	X	X	X
	3	Any alarms, ID 4	X	X	X	X	X	X	X	X
	4	Any alarms, ID 5	X	X	X	X	X	X	X	X
	5	Any alarms, ID 6	X	X	X	X	X	X	X	X
	6	Any alarms, ID 7	X	X	X	X	X	X	X	X
	7	Any alarms, ID 8	X	X	X	X	X	X	X	X
	8	Any alarms, ID 9	X	X	X	X	X	X	X	X
	9	Any alarms, ID 10	X	X	X	X	X	X	X	X
	10	Any alarms, ID 11	X	X	X	X	X	X	X	X
	11	Any alarms, ID 12	X	X	X	X	X	X	X	X
	12	Any alarms, ID 13	X	X	X	X	X	X	X	X
	13	Any alarms, ID 14	X	X	X	X	X	X	X	X
	14	Any alarms, ID 15	X	X	X	X	X	X	X	X
	15	Any alarms, ID 16	X	X	X	X	X	X	X	X
1708	0	Any alarms, single mains	X	X	X					
	1	Any alarms, mains 1A	X	X	X					
	2	Any alarms, mains 1B	X	X	X					
	3	Any alarms, mains 2A	X	X	X					
	4	Any alarms, mains 2B	X	X	X					
	5									

Addr.	Bit	Function	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
	6									
	7									
	8									
	9									
	10									
	11									
	12									
	13									
	14									
	15									
1709	0	Engine running, ID 1	X	X	X	X	X	X	X	X
	1	Engine running, ID 2	X	X	X	X	X	X	X	X
	2	Engine running, ID 3	X	X	X	X	X	X	X	X
	3	Engine running, ID 4	X	X	X	X	X	X	X	X
	4	Engine running, ID 5	X	X	X	X	X	X	X	X
	5	Engine running, ID 6	X	X	X	X	X	X	X	X
	6	Engine running, ID 7	X	X	X	X	X	X	X	X
	7	Engine running, ID 8	X	X	X	X	X	X	X	X
	8	Engine running, ID 9	X	X	X	X	X	X	X	X
	9	Engine running, ID 10	X	X	X	X	X	X	X	X
	10	Engine running, ID 11	X	X	X	X	X	X	X	X
	11	Engine running, ID 12	X	X	X	X	X	X	X	X
	12	Engine running, ID 13	X	X	X	X	X	X	X	X
	13	Engine running, ID 14	X	X	X	X	X	X	X	X
	14	Engine running, ID 15	X	X	X	X	X	X	X	X

Addr.	Bit	Function	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
	15	Engine running, ID 16	X	X	X	X	X	X	X	X
1710	0	MB pos. ON, single mains	X	X	X					
	1	MB pos. ON, mains 1A	X	X	X					
	2	MB pos. ON, mains 1B	X	X	X					
	3	MB pos. ON, mains 2A	X	X	X					
	4	MB pos. ON, mains 2B	X	X	X					
	5	MB pos. OFF, single mains	X	X	X					
	6	MB pos. OFF, mains 1A	X	X	X					
	7	MB pos. OFF, mains 1B	X	X	X					
	8	MB pos. OFF, mains 2A	X	X	X					
	9	MB pos. OFF, mains 2B	X	X	X					
	10									
	11									
	12									
	13									
	14									
	15									
1711	0	GB synchronising, ID 1	X	X	X	X	X	X	X	X
	1	GB synchronising, ID 2	X	X	X	X	X	X	X	X
	2	GB synchronising, ID 3	X	X	X	X	X	X	X	X
	3	GB synchronising, ID 4	X	X	X	X	X	X	X	X
	4	GB synchronising, ID 5	X	X	X	X	X	X	X	X
	5	GB synchronising, ID 6	X	X	X	X	X	X	X	X
	6	GB synchronising, ID 7	X	X	X	X	X	X	X	X
	7	GB synchronising, ID 8	X	X	X	X	X	X	X	X

Addr.	Bit	Function	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
	8	GB synchronising, ID 9	X	X	X	X	X	X	X	X
	9	GB synchronising, ID 10	X	X	X	X	X	X	X	X
	10	GB synchronising, ID 11	X	X	X	X	X	X	X	X
	11	GB synchronising, ID 12	X	X	X	X	X	X	X	X
	12	GB synchronising, ID 13	X	X	X	X	X	X	X	X
	13	GB synchronising, ID 14	X	X	X	X	X	X	X	X
	14	GB synchronising, ID 15	X	X	X	X	X	X	X	X
	15	GB synchronising, ID 16	X	X	X	X	X	X	X	X
1712	0	Mains OK, ID 17	X	X	X					
		Shaft OK, ID 17				X	X	X	X	X
		Shore OK, ID 17				X	X	X	X	X
	1	Mains OK, ID 18	X	X	X					
		Shaft OK, ID 18				X	X	X	X	X
		Shore OK, ID 18				X	X	X	X	X
	2	Mains OK, ID 19	X	X	X					
		Shaft OK, ID 19				X	X	X	X	X
		Shore OK, ID 19				X	X	X	X	X
	3	Mains OK, ID 20	X	X	X					
		Shaft OK, ID 20				X	X	X	X	X
		Shore OK, ID 20				X	X	X	X	X
	4	Mains OK, ID 21	X	X	X					
	5	Mains OK, ID 22	X	X	X					
	6	Mains OK, ID 23	X	X	X					
	7	Mains OK, ID 24	X	X	X					
	8	Mains OK, ID 25	X	X	X					

Addr.	Bit	Function	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
	9	Mains OK, ID 26	X	X	X					
	10	Mains OK, ID 27	X	X	X					
	11	Mains OK, ID 28	X	X	X					
	12	Mains OK, ID 29	X	X	X					
	13	Mains OK, ID 30	X	X	X					
	14	Mains OK, ID 31	X	X	X					
	15	Mains OK, ID 32	X	X	X					
1713	0	Mains not in semi 17	X	X	X					
	1	Mains not in semi 18	X	X	X					
	2	Mains not in semi 19	X	X	X					
	3	Mains not in semi 20	X	X	X					
	4	Mains not in semi 21	X	X	X					
	5	Mains not in semi 22	X	X	X					
	6	Mains not in semi 23	X	X	X					
	7	Mains not in semi 24	X	X	X					
	8	Mains not in semi 25	X	X	X					
	9	Mains not in semi 26	X	X	X					
	10	Mains not in semi 27	X	X	X					
	11	Mains not in semi 28	X	X	X					
	12	Mains not in semi 29	X	X	X					
	13	Mains not in semi 30	X	X	X					
	14	Mains not in semi 31	X	X	X					
	15	Mains not in semi 32	X	X	X					
1714	0	Any alarms, mains ID 17	X	X	X					
		Any alarms, Shaft ID 17				X	X	X	X	X

Addr.	Bit	Function	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
		Any alarms, Shore ID 17				X	X	X	X	X
	1	Any alarms, mains ID 18	X	X	X					
		Any alarms, Shaft ID 18				X	X	X	X	X
		Any alarms, Shore ID 18				X	X	X	X	X
	2	Any alarms, mains ID 19	X	X	X					
		Any alarms, Shaft ID 19				X	X	X	X	X
		Any alarms, Shore ID 19				X	X	X	X	X
	3	Any alarms, mains ID 20	X	X	X					
		Any alarms, Shaft ID 20				X	X	X	X	X
		Any alarms, Shore ID 20				X	X	X	X	X
	4	Any alarms, mains ID 21	X	X	X					
	5	Any alarms, mains ID 22	X	X	X					
	6	Any alarms, mains ID 23	X	X	X					
	7	Any alarms, mains ID 24	X	X	X					
	8	Any alarms, mains ID 25	X	X	X					
	9	Any alarms, mains ID 26	X	X	X					
	10	Any alarms, mains ID 27	X	X	X					
	11	Any alarms, mains ID 28	X	X	X					
	12	Any alarms, mains ID 29	X	X	X					
	13	Any alarms, mains ID 30	X	X	X					
	14	Any alarms, mains ID 31	X	X	X					
	15	Any alarms, mains ID 32	X	X	X					
1715	0	MB pos. ON, ID 17	X	X	X					
		SGB/SCB ON, ID 17				X	X	X	X	X
	1	MB pos. ON, ID 18	X	X	X					

Addr.	Bit	Function	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
		SGB ON, ID 18		X	X	X	X	X	X	X
	2	MB pos. ON, ID 19	X	X	X					
		SGB/SCB ON, ID 19		X	X	X	X	X	X	X
	3	MB pos. ON, ID 20	X	X	X					
		SGB/SCB ON, ID 20		X	X	X	X	X	X	X
	4	MB pos. ON, ID 21	X	X	X					
	5	MB pos. ON, ID 22	X	X	X					
	6	MB pos. ON, ID 23	X	X	X					
	7	MB pos. ON, ID 24	X	X	X					
	8	MB pos. ON, ID 25	X	X	X					
	9	MB pos. ON, ID 26	X	X	X					
	10	MB pos. ON, ID 27	X	X	X					
	11	MB pos. ON, ID 28	X	X	X					
	12	MB pos. ON, ID 29	X	X	X					
	13	MB pos. ON, ID 30	X	X	X					
	14	MB pos. ON, ID 31	X	X	X					
	15	MB pos. ON, ID 32	X	X	X					
1716	0	MB pos. OFF, ID 17	X	X	X					
		SGB/SCB pos OFF, ID 17				X	X	X	X	X
	1	MB pos. OFF, ID 18	X	X	X					
		SGB/SCB pos OFF, ID 18				X	X	X	X	X
	2	MB pos. OFF, ID 19	X	X	X					
		SGB/SCB pos OFF, ID 19				X	X	X	X	X
	3	MB pos. OFF, ID 20	X	X	X					
	4	MB pos. OFF, ID 21	X	X	X					

Addr.	Bit	Function	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
	5	MB pos. OFF, ID 22	X	X	X					
	6	MB pos. OFF, ID 23	X	X	X					
	7	MB pos. OFF, ID 24	X	X	X					
	8	MB pos. OFF, ID 25	X	X	X					
	9	MB pos. OFF, ID 26	X	X	X					
	10	MB pos. OFF, ID 27	X	X	X					
	11	MB pos. OFF, ID 28	X	X	X					
	12	MB pos. OFF, ID 29	X	X	X					
	13	MB pos. OFF, ID 30	X	X	X					
	14	MB pos. OFF, ID 31	X	X	X					
	15	MB pos. OFF, ID 32	X	X	X					
1717	0	Mains failure, ID 17	X	X	X					
	1	Mains failure, ID 18	X	X	X					
	2	Mains failure, ID 19	X	X	X					
	3	Mains failure, ID 20	X	X	X					
	4	Mains failure, ID 21	X	X	X					
	5	Mains failure, ID 22	X	X	X					
	6	Mains failure, ID 23	X	X	X					
	7	Mains failure, ID 24	X	X	X					
	8	Mains failure, ID 25	X	X	X					
	9	Mains failure, ID 26	X	X	X					
	10	Mains failure, ID 27	X	X	X					
	11	Mains failure, ID 28	X	X	X					
	12	Mains failure, ID 29	X	X	X					
	13	Mains failure, ID 30	X	X	X					

Addr.	Bit	Function	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
	14	Mains failure, ID 31	X	X	X					
	15	Mains failure, ID 32	X	X	X					
1718	0	MB synchronising, ID 17	X	X	X					
		SGB/SCB synchronising, ID 17				X	X	X	X	X
	1	MB synchronising, ID 18	X	X	X					
		SGB/SCB synchronising, ID 18				X	X	X	X	X
	2	MB synchronising, ID 19	X	X	X					
		SGB/SCB synchronising, ID 19				X	X	X	X	X
	3	MB synchronising, ID 20	X	X	X					
		SGB/SCB synchronising, ID 20				X	X	X	X	X
	4	MB synchronising, ID 21	X	X	X					
	5	MB synchronising, ID 22	X	X	X					
	6	MB synchronising, ID 23	X	X	X					
	7	MB synchronising, ID 24	X	X	X					
	8	MB synchronising, ID 25	X	X	X					
	9	MB synchronising, ID 26	X	X	X					
	10	MB synchronising, ID 27	X	X	X					
	11	MB synchronising, ID 28	X	X	X					
	12	MB synchronising, ID 29	X	X	X					
	13	MB synchronising, ID 30	X	X	X					
	14	MB synchronising, ID 31	X	X	X					
	15	MB synchronising, ID 32	X	X	X					
1719	0	TB pos. ON, ID 17	X	X	X					
	1	TB pos. ON, ID 18	X	X	X					
	2	TB pos. ON, ID 19	X	X	X					

Addr.	Bit	Function	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
	3	TB pos. ON, ID 20	X	X	X					
	4	TB pos. ON, ID 21	X	X	X					
	5	TB pos. ON, ID 22	X	X	X					
	6	TB pos. ON, ID 23	X	X	X					
	7	TB pos. ON, ID 24	X	X	X					
	8	TB pos. ON, ID 25	X	X	X					
	9	TB pos. ON, ID 26	X	X	X					
	10	TB pos. ON, ID 27	X	X	X					
	11	TB pos. ON, ID 28	X	X	X					
	12	TB pos. ON, ID 29	X	X	X					
	13	TB pos. ON, ID 30	X	X	X					
	14	TB pos. ON, ID 31	X	X	X					
	15	TB pos. ON, ID 32	X	X	X					
1720	0	TB pos. OFF, ID 17	X	X	X					
	1	TB pos. OFF, ID 18	X	X	X					
	2	TB pos. OFF, ID 19	X	X	X					
	3	TB pos. OFF, ID 20	X	X	X					
	4	TB pos. OFF, ID 21	X	X	X					
	5	TB pos. OFF, ID 22	X	X	X					
	6	TB pos. OFF, ID 23	X	X	X					
	7	TB pos. OFF, ID 24	X	X	X					
	8	TB pos. OFF, ID 25	X	X	X					
	9	TB pos. OFF, ID 26	X	X	X					
	10	TB pos. OFF, ID 27	X	X	X					
	11	TB pos. OFF, ID 28	X	X	X					

Addr.	Bit	Function	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
	12	TB pos. OFF, ID 29	X	X	X					
	13	TB pos. OFF, ID 30	X	X	X					
	14	TB pos. OFF, ID 31	X	X	X					
	15	TB pos. OFF, ID 32	X	X	X					
1721	0	TB synchronising, ID 17	X	X	X					
	1	TB synchronising, ID 18	X	X	X					
	2	TB synchronising, ID 19	X	X	X					
	3	TB synchronising, ID 20	X	X	X					
	4	TB synchronising, ID 21	X	X	X					
	5	TB synchronising, ID 22	X	X	X					
	6	TB synchronising, ID 23	X	X	X					
	7	TB synchronising, ID 24	X	X	X					
	8	TB synchronising, ID 25	X	X	X					
	9	TB synchronising, ID 26	X	X	X					
	10	TB synchronising, ID 27	X	X	X					
	11	TB synchronising, ID 28	X	X	X					
	12	TB synchronising, ID 29	X	X	X					
	13	TB synchronising, ID 30	X	X	X					
	14	TB synchronising, ID 31	X	X	X					
	15	TB synchronising, ID 32	X	X	X					
1722	0	Any alarms, BTB ID 33	X	X	X	X	X	X	X	X
	1	Any alarms, BTB ID 34	X	X	X	X	X	X	X	X
	2	Any alarms, BTB ID 35	X	X	X	X	X	X	X	X
	3	Any alarms, BTB ID 36	X	X	X	X	X	X	X	X
	4	Any alarms, BTB ID 37	X	X	X	X	X	X	X	X

Addr.	Bit	Function	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
	5	Any alarms, BTB ID 38	X	X	X	X	X	X	X	X
	6	Any alarms, BTB ID 39	X	X	X	X	X	X	X	X
	7	Any alarms, BTB ID 40	X	X	X	X	X	X	X	X
	8									
	9									
	10									
	11									
	12									
	13									
	14									
	15									
1723	0	BTB pos. ON, ID 33	X	X	X	X	X	X	X	X
	1	BTB pos. ON, ID 34	X	X	X	X	X	X	X	X
	2	BTB pos. ON, ID 35	X	X	X	X	X	X	X	X
	3	BTB pos. ON, ID 36	X	X	X	X	X	X	X	X
	4	BTB pos. ON, ID 37	X	X	X	X	X	X	X	X
	5	BTB pos. ON, ID 38	X	X	X	X	X	X	X	X
	6	BTB pos. ON, ID 39	X	X	X	X	X	X	X	X
	7	BTB pos. ON, ID 40	X	X	X	X	X	X	X	X
	8									
	9									
	10									
	11									
	12									
	13									

Addr.	Bit	Function	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
	14									
	15									
1724	0	BTB pos. OFF, ID 33	X	X	X	X	X	X	X	X
	1	BTB pos. OFF, ID 34	X	X	X	X	X	X	X	X
	2	BTB pos. OFF, ID 35	X	X	X	X	X	X	X	X
	3	BTB pos. OFF, ID 36	X	X	X	X	X	X	X	X
	4	BTB pos. OFF, ID 37	X	X	X	X	X	X	X	X
	5	BTB pos. OFF, ID 38	X	X	X	X	X	X	X	X
	6	BTB pos. OFF, ID 39	X	X	X	X	X	X	X	X
	7	BTB pos. OFF, ID 40	X	X	X	X	X	X	X	X
	8									
	9									
	10									
	11									
	12									
	13									
	14									
	15									
1725	0	BTB synchronising, ID 33	X	X	X	X	X	X	X	X
	1	BTB synchronising, ID 34	X	X	X	X	X	X	X	X
	2	BTB synchronising, ID 35	X	X	X	X	X	X	X	X
	3	BTB synchronising, ID 36	X	X	X	X	X	X	X	X
	4	BTB synchronising, ID 37	X	X	X	X	X	X	X	X
	5	BTB synchronising, ID 38	X	X	X	X	X	X	X	X
	6	BTB synchronising, ID 39	X	X	X	X	X	X	X	X

Addr.	Bit	Function	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
	7	BTB synchronising, ID 40	X	X	X	X	X	X	X	X
	8									
	9									
	10									
	11									
	12									
	13									
	14									
	15									
1726	0	Ext. comm. error, ID 1	X	X	X	X	X	X	X	X
	1	Ext. comm. error, ID 2	X	X	X	X	X	X	X	X
	2	Ext. comm. error, ID 3	X	X	X	X	X	X	X	X
	3	Ext. comm. error, ID 4	X	X	X	X	X	X	X	X
	4	Ext. comm. error, ID 5	X	X	X	X	X	X	X	X
	5	Ext. comm. error, ID 6	X	X	X	X	X	X	X	X
	6	Ext. comm. error, ID 7	X	X	X	X	X	X	X	X
	7	Ext. comm. error, ID 8	X	X	X	X	X	X	X	X
	8	Ext. comm. error, ID 9	X	X	X	X	X	X	X	X
	9	Ext. comm. error, ID 10	X	X	X	X	X	X	X	X
	10	Ext. comm. error, ID 11	X	X	X	X	X	X	X	X
	11	Ext. comm. error, ID 12	X	X	X	X	X	X	X	X
	12	Ext. comm. error, ID 13	X	X	X	X	X	X	X	X
	13	Ext. comm. error, ID 14	X	X	X	X	X	X	X	X
	14	Ext. comm. error, ID 15	X	X	X	X	X	X	X	X
	15	Ext. comm. error, ID 16	X	X	X	X	X	X	X	X

Addr.	Bit	Function	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
1727	0	Ext. comm. error, ID 17	X	X	X	X	X	X	X	X
	1	Ext. comm. error, ID 18	X	X	X	X	X	X	X	X
	2	Ext. comm. error, ID 19	X	X	X	X	X	X	X	X
	3	Ext. comm. error, ID 20	X	X	X	X	X	X	X	X
	4	Ext. comm. error, ID 21	X	X	X	X	X	X	X	X
	5	Ext. comm. error, ID 22	X	X	X	X	X	X	X	X
	6	Ext. comm. error, ID 23	X	X	X	X	X	X	X	X
	7	Ext. comm. error, ID 24	X	X	X	X	X	X	X	X
	8	Ext. comm. error, ID 25	X	X	X	X	X	X	X	X
	9	Ext. comm. error, ID 26	X	X	X	X	X	X	X	X
	10	Ext. comm. error, ID 27	X	X	X	X	X	X	X	X
	11	Ext. comm. error, ID 28	X	X	X	X	X	X	X	X
	12	Ext. comm. error, ID 29	X	X	X	X	X	X	X	X
	13	Ext. comm. error, ID 30	X	X	X	X	X	X	X	X
	14	Ext. comm. error, ID 31	X	X	X	X	X	X	X	X
	15	Ext. comm. error, ID 32	X	X	X	X	X	X	X	X
1728	0	Ext. comm. error, ID 33	X	X	X	X	X	X	X	X
	1	Ext. comm. error, ID 34	X	X	X	X	X	X	X	X
	2	Ext. comm. error, ID 35	X	X	X	X	X	X	X	X
	3	Ext. comm. error, ID 36	X	X	X	X	X	X	X	X
	4	Ext. comm. error, ID 37	X	X	X	X	X	X	X	X
	5	Ext. comm. error, ID 38	X	X	X	X	X	X	X	X
	6	Ext. comm. error, ID 39	X	X	X	X	X	X	X	X
	7	Ext. comm. error, ID 40	X	X	X	X	X	X	X	X
	8									

Addr.	Bit	Function	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
	9									
	10									
	11									
	12									
	13									
	14									
	15									
	0	EDG TB pos. ON, ID 1				X	X	X	X	X
	1	EDG TB pos. ON, ID 2				X	X	X	X	X
	2	EDG TB pos. ON, ID 3				X	X	X	X	X
	3	EDG TB pos. ON, ID 4				X	X	X	X	X
	4	EDG TB pos. ON, ID 5				X	X	X	X	X
	5	EDG TB pos. ON, ID 6				X	X	X	X	X
	6	EDG TB pos. ON, ID 7				X	X	X	X	X
	7	EDG TB pos. ON, ID 8				X	X	X	X	X
1729	8	EDG TB pos. ON, ID 9				X	X	X	X	X
	9	EDG TB pos. ON, ID 10				X	X	X	X	X
	10	EDG TB pos. ON, ID 11				X	X	X	X	X
	11	EDG TB pos. ON, ID 12				X	X	X	X	X
	12	EDG TB pos. ON, ID 13				X	X	X	X	X
	13	EDG TB pos. ON, ID 14				X	X	X	X	X
	14	EDG TB pos. ON, ID 15				X	X	X	X	X
	15	EDG TB pos. ON, ID 16				X	X	X	X	X
1730	0	EDG TB pos. OFF, ID 1				X	X	X	X	X
	1	EDG TB pos. OFFI, D 2				X	X	X	X	X

Addr.	Bit	Function	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
	2	EDG TB pos. OFF, ID 3				X	X	X	X	X
	3	EDG TB pos. OFF, ID 4				X	X	X	X	X
	4	EDG TB pos. OFF, ID 5				X	X	X	X	X
	5	EDG TB pos. OFF, ID 6				X	X	X	X	X
	6	EDG TB pos. OFF, ID 7				X	X	X	X	X
	7	EDG TB pos. OFF, ID 8				X	X	X	X	X
	8	EDG TB pos. OFF, ID 9				X	X	X	X	X
	9	EDG TB pos. OFF, ID 10				X	X	X	X	X
	10	EDG TB pos. OFF, ID 11				X	X	X	X	X
	11	EDG TB pos. OFF, ID 12				X	X	X	X	X
	12	EDG TB pos. OFF, ID 13				X	X	X	X	X
	13	EDG TB pos. OFF, ID 14				X	X	X	X	X
	14	EDG TB pos. OFF, ID 15				X	X	X	X	X
	15	EDG TB pos. OFF, ID 16				X	X	X	X	X
1731	0	Shaft/shore running ID 17				X	X	X	X	X
	1	Shaft/shore running ID 18				X	X	X	X	X
	2	Shaft/shore running ID 19				X	X	X	X	X
	3	Shaft/shore running ID 20					X	X	X	X
	4									
	5									
	6									
	7									
	8									
	9									
	10									

Addr.	Bit	Function	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
	11									
	12									
	13									
	14									
	15									
1732	0	BB Hz/V OK, ID 1	X	X	X	X	X	X	X	X
	1	BB Hz/V OK, ID 2	X	X	X	X	X	X	X	X
	2	BB Hz/V OK, ID 3	X	X	X	X	X	X	X	X
	3	BB Hz/V OK, ID 4	X	X	X	X	X	X	X	X
	4	BB Hz/V OK, ID 5	X	X	X	X	X	X	X	X
	5	BB Hz/V OK, ID 6	X	X	X	X	X	X	X	X
	6	BB Hz/V OK, ID 7	X	X	X	X	X	X	X	X
	7	BB Hz/V OK, ID 8	X	X	X	X	X	X	X	X
	8	BB Hz/V OK, ID 9	X	X	X	X	X	X	X	X
	9	BB Hz/V OK, ID 10	X	X	X	X	X	X	X	X
	10	BB Hz/V OK, ID 11	X	X	X	X	X	X	X	X
	11	BB Hz/V OK, ID 12	X	X	X	X	X	X	X	X
	12	BB Hz/V OK, ID 13	X	X	X	X	X	X	X	X
	13	BB Hz/V OK, ID 14	X	X	X	X	X	X	X	X
	14	BB Hz/V OK, ID 15	X	X	X	X	X	X	X	X
	15	BB Hz/V OK, ID 16	X	X	X	X	X	X	X	X
1733	0	BB Hz/V OK, ID 17	X	X	X	X	X	X	X	X
	1	BB Hz/V OK, ID 18	X	X	X	X	X	X	X	X
	2	BB Hz/V OK, ID 19	X	X	X	X	X	X	X	X
	3	BB Hz/V OK, ID 20	X	X	X	X	X	X	X	X

Addr.	Bit	Function	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
	4	BB Hz/V OK, ID 21	X	X	X					
	5	BB Hz/V OK, ID 22	X	X	X					
	6	BB Hz/V OK, ID 23	X	X	X					
	7	BB Hz/V OK, ID 24	X	X	X					
	8	BB Hz/V OK, ID 25	X	X	X					
	9	BB Hz/V OK, ID 26	X	X	X					
	10	BB Hz/V OK, ID 27	X	X	X					
	11	BB Hz/V OK, ID 28	X	X	X					
	12	BB Hz/V OK, ID 29	X	X	X					
	13	BB Hz/V OK, ID 30	X	X	X					
	14	BB Hz/V OK, ID 31	X	X	X					
	15	BB Hz/V OK, ID 32	X	X	X					
1734	0	BB Hz/V OK, ID 33	X	X	X	X	X	X	X	X
	1	BB Hz/V OK, ID 34	X	X	X	X	X	X	X	X
	2	BB Hz/V OK, ID 35	X	X	X	X	X	X	X	X
	3	BB Hz/V OK, ID 36	X	X	X	X	X	X	X	X
	4	BB Hz/V OK, ID 37	X	X	X	X	X	X	X	X
	5	BB Hz/V OK, ID 38	X	X	X	X	X	X	X	X
	6	BB Hz/V OK, ID 39	X	X	X	X	X	X	X	X
	7	BB Hz/V OK, ID 40	X	X	X	X	X	X	X	X
1735	0	BB Hz/V present, ID 1	X	X	X	X	X	X	X	X
	1	BB Hz/V present, ID 2	X	X	X	X	X	X	X	X
	2	BB Hz/V present, ID 3	X	X	X	X	X	X	X	X
	3	BB Hz/V present, ID 4	X	X	X	X	X	X	X	X
	4	BB Hz/V present, ID 5	X	X	X	X	X	X	X	X

Addr.	Bit	Function	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
	5	BB Hz/V present, ID 6	X	X	X	X	X	X	X	X
	6	BB Hz/V present, ID 7	X	X	X	X	X	X	X	X
	7	BB Hz/V present, ID 8	X	X	X	X	X	X	X	X
	8	BB Hz/V present, ID 9	X	X	X	X	X	X	X	X
	9	BB Hz/V present, ID 10	X	X	X	X	X	X	X	X
	10	BB Hz/V present, ID 11	X	X	X	X	X	X	X	X
	11	BB Hz/V present, ID 12	X	X	X	X	X	X	X	X
	12	BB Hz/V present, ID 13	X	X	X	X	X	X	X	X
	13	BB Hz/V present, ID 14	X	X	X	X	X	X	X	X
	14	BB Hz/V present, ID 15	X	X	X	X	X	X	X	X
	15	BB Hz/V present, ID 16	X	X	X	X	X	X	X	X
1736	0	BB Hz/V present, ID 17	X	X	X	X	X	X	X	X
	1	BB Hz/V present, ID 18	X	X	X	X	X	X	X	X
	2	BB Hz/V present, ID 19	X	X	X	X	X	X	X	X
	3	BB Hz/V present, ID 20	X	X	X	X	X	X	X	X
	4	BB Hz/V present, ID 21	X	X	X					
	5	BB Hz/V present, ID 22	X	X	X					
	6	BB Hz/V present, ID 23	X	X	X					
	7	BB Hz/V present, ID 24	X	X	X					
	8	BB Hz/V present, ID 25	X	X	X					
	9	BB Hz/V present, ID 26	X	X	X					
	10	BB Hz/V present, ID 27	X	X	X					
	11	BB Hz/V present, ID 28	X	X	X					
	12	BB Hz/V present, ID 29	X	X	X					
	13	BB Hz/V present, ID 30	X	X	X					

Addr.	Bit	Function	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
	14	BB Hz/V present, ID 31	X	X	X					
	15	BB Hz/V present, ID 32	X	X	X					
1737	0	BB Hz/V present, ID 33	X	X	X	X	X	X	X	
	1	BB Hz/V present, ID 34	X	X	X	X	X	X	X	
	2	BB Hz/V present, ID 35	X	X	X	X	X	X	X	
	3	BB Hz/V present, ID 36	X	X	X	X	X	X	X	
	4	BB Hz/V present, ID 37	X	X	X	X	X	X	X	
	5	BB Hz/V present, ID 38	X	X	X	X	X	X	X	
	6	BB Hz/V present, ID 39	X	X	X	X	X	X	X	
	7	BB Hz/V present, ID 40	X	X	X	X	X	X	X	
1738	0	BA Hz/V OK, ID 32	X	X	X	X	X	X	X	
	1	BA Hz/V OK, ID 33	X	X	X	X	X	X	X	
	2	BA Hz/V OK, ID 34	X	X	X	X	X	X	X	
	3	BA Hz/V OK, ID 35	X	X	X	X	X	X	X	
	4	BA Hz/V OK, ID 36	X	X	X	X	X	X	X	
	5	BA Hz/V OK, ID 37	X	X	X	X	X	X	X	
	6	BA Hz/V OK, ID 38	X	X	X	X	X	X	X	
	7	BA Hz/V OK, ID 39	X	X	X	X	X	X	X	
1739	0	BA Hz/V present, ID 1			X	X	X	X	X	
		Mains present, ID 1		X						
		DG Hz/V present, ID 1	X							
	1	BA Hz/V present, ID 2			X	X	X	X	X	
		Mains present, ID 2		X						
		DG Hz/V present, ID 2	X							
	2	BA Hz/V present, ID 3			X	X	X	X	X	

Addr.	Bit	Function	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
		Mains present, ID 3		X						
		DG Hz/V present, ID 3	X							
	3	BA Hz/V present, ID 4			X	X	X	X	X	
		Mains present, ID 4		X						
		DG Hz/V present, ID 4	X							
	4	BA Hz/V present, ID 5			X	X	X	X	X	
		Mains present, ID 5		X						
		DG Hz/V present, ID 5	X							
	5	BA Hz/V present, ID 6			X	X	X	X	X	
		Mains present, ID 6		X						
		DG Hz/V present, ID 6	X							
	6	BA Hz/V present, ID 7			X	X	X	X	X	
		Mains present, ID 7		X						
		DG Hz/V present, ID 7	X							
	7	BA Hz/V present, ID 8			X	X	X	X	X	
		Mains present, ID 8		X						
		DG Hz/V present, ID 8	X							
	8	BA Hz/V present, ID 9			X	X	X	X	X	
		Mains present, ID 9		X						
		DG Hz/V present, ID 9	X							
	9	BA Hz/V present, ID 10			X	X	X	X	X	
		Mains present, ID 10		X						
		DG Hz/V present, ID 10	X							
	10	BA Hz/V present, ID 11			X	X	X	X	X	
		Mains present, ID 11		X						

Addr.	Bit	Function	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
		DG Hz/V present, ID 11	X							
	11	BA Hz/V present, ID 12			X	X	X	X	X	
		Mains present, ID 12		X						
		DG Hz/V present, ID 12	X							
	12	BA Hz/V present, ID 13			X	X	X	X	X	
		Mains present, ID 13		X						
		DG Hz/V present, ID 13	X							
	13	BA Hz/V present, ID 14			X	X	X	X	X	
		Mains present, ID 14		X						
		DG Hz/V present, ID 14	X							
	14	BA Hz/V present, ID 15			X	X	X	X	X	
		Mains present, ID 15		X						
		DG Hz/V present, ID 15	X							
	15	BA Hz/V present, ID 16			X	X	X	X	X	
		Mains present, ID 16		X						
		DG Hz/V present, ID 16	X							
1740	0	BA Hz/V present, ID 17			X	X	X	X	X	
		Mains present, ID 17		X						
		DG Hz/V present, ID 17	X							
	1	BA Hz/V present, ID 18			X	X	X	X	X	
		Mains present, ID 18		X						
		DG Hz/V present, ID 18	X							
	2	BA Hz/V present, ID 19			X	X	X	X	X	
		Mains present, ID 19		X						
		DG Hz/V present, ID 19	X							

Addr.	Bit	Function	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
	3	BA Hz/V present, ID 20			X	X	X	X	X	
		Mains present, ID 20		X						
		DG Hz/V present, ID 20	X							
	4	BA Hz/V present, ID 21			X					
		Mains present, ID 21		X						
		DG Hz/V present, ID 21	X							
	5	BA Hz/V present, ID 22			X					
		Mains present, ID 22		X						
		DG Hz/V present, ID 22	X							
	6	BA Hz/V present, ID 23			X					
		Mains present, ID 23		X						
		DG Hz/V present, ID 23	X							
	7	BA Hz/V present, ID 24			X					
		Mains present, ID 24		X						
		DG Hz/V present, ID 24	X							
	8	BA Hz/V present, ID 25			X					
		Mains present, ID 25		X						
		DG Hz/V present, ID 25	X							
	9	BA Hz/V present, ID 26			X					
		Mains present, ID 26		X						
		DG Hz/V present, ID 26	X							
	10	BA Hz/V present, ID 27			X					
		Mains present, ID 27		X						
		DG Hz/V present, ID 27	X							
	11	BA Hz/V present, ID 28			X					

Addr.	Bit	Function	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
		Mains present, ID 28		X						
		DG Hz/V present, ID 28	X							
	12	BA Hz/V present, ID 29			X					
		Mains present, ID 29		X						
		DG Hz/V present, ID 29	X							
	13	BA Hz/V present, ID 30			X					
		Mains present, ID 30		X						
		DG Hz/V present, ID 30	X							
	14	BA Hz/V present, ID 31			X					
		Mains present, ID 31		X						
		DG Hz/V present, ID 31	X							
	15	BA Hz/V present, ID 32			X					
		Mains present, ID 32		X						
		DG Hz/V present, ID 32	X							
1741	0	BA Hz/V present, ID 33			X	X	X	X	X	X
		Mains present, ID 33		X						
		DG Hz/V present, ID 33	X							
	1	BA Hz/V present, ID 34			X	X	X	X	X	X
		Mains present, ID 34		X						
		DG Hz/V present, ID 34	X							
	2	BA Hz/V present, ID 35			X	X	X	X	X	X
		Mains present, ID 35		X						
		DG Hz/V present, ID 35	X							
	3	BA Hz/V present, ID 36			X	X	X	X	X	X
		Mains present, ID 36		X						

Addr.	Bit	Function	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
		DG Hz/V present, ID 36	X							
	4	BA Hz/V present, ID 37			X	X	X	X	X	X
		Mains present, ID 37		X						
		DG Hz/V present, ID 37	X							
	5	BA Hz/V present, ID 38			X	X	X	X	X	X
		Mains present, ID 38		X						
		DG Hz/V present, ID 38	X							
	6	BA Hz/V present, ID 39			X	X	X	X	X	X
		Mains present, ID 39		X						
		DG Hz/V present, ID 39	X							
	7	BA Hz/V present, ID 40			X	X	X	X	X	X
		Mains present, ID 40		X						
		DG Hz/V present, ID 40	X							
1742	0	EDG TB synchronising ID 1				X	X	X	X	X
	1	EDG TB synchronising ID 2				X	X	X	X	X
	2	EDG TB synchronising ID 3				X	X	X	X	X
	3	EDG TB synchronising ID 4				X	X	X	X	X
	4	EDG TB synchronising ID 5				X	X	X	X	X
	5	EDG TB synchronising ID 6				X	X	X	X	X
	6	EDG TB synchronising ID 7				X	X	X	X	X
	7	EDG TB synchronising ID 8				X	X	X	X	X
	8	EDG TB synchronising ID 9				X	X	X	X	X
	9	EDG TB synchronising ID 10				X	X	X	X	X
	10	EDG TB synchronising ID 11				X	X	X	X	X
	11	EDG TB synchronising ID 12				X	X	X	X	X

Addr.	Bit	Function	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
	12	EDG TB synchronising ID 13				X	X	X	X	X
	13	EDG TB synchronising ID 14				X	X	X	X	X
	14	EDG TB synchronising ID 15				X	X	X	X	X
	15	EDG TB synchronising ID 16				X	X	X	X	X
1743-1999		Reserved								

Control register table read (03h)/write(10h)

Address	Content	Description	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
0	Power regulator set point	0...100% of nominal power. Activated in menu 7501	X	X		X	X			
1	PF regulator set point	60...100 stated as PF value/100. The value 100 means PF = 1. Activated in menu 7504	X			X	X			
2	Reactive power regulator set point	+/-100% of nominal power. A negative value means capacitive reactive power, and a positive value means inductive reactive power. Activated in menu 7505	X			X	X			
3	Frequency regulator set point	+/-100% corresponding to +/-10.0% of nominal frequency. Activated in menu 7502	X			X	X			
4	Voltage regulator set point	+/-100% corresponding to +/-10.0% of nominal voltage. Activated in menu 7503	X			X	X			
5	Control command	Bit 0 This bit must be 1 when writing the command word. If the bit is 0, the control command is ignored.	X	X	X	X	X	X	X	X

Address	Content	Description		AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
		Bit 1	Start	X			X	X			
		Bit 2	GB ON	X			X	X			
		Bit 2	TB ON		X						
		Bit3	GB OFF	X			X	X			
		Bit 3	TB OFF		X						
		Bit 4	Stop	X			X	X			
		Bit 5	Reset analogue regulation outputs	X			X	X			
		Bit 6	Start sync (semi)				X	X			
		Bit 7	Alarm inhibit 1	X	X	X	X	X	X	X	X
		Bit 8	Alarm inhibit 2	X	X	X	X	X	X	X	X
		Bit 9	Alarm inhibit 3	X	X	X	X	X	X	X	X
		Bit 10	Alarm ack. This bit is automatically reset	X	X	X	X	X	X	X	X
		Bit 11	Nominal setting 1	X	X	X	X	X	X	X	X
		Bit 12	Nominal setting 2	X	X	X	X	X	X	X	X
		Bit 13	Nominal setting 3	X	X	X					
		Bit 14	Nominal setting 4	X	X	X					
		Bit 15	Deload (Semi)				X	X			
6	Control command	Bit 0	This bit must be 1 when writing the	X	X	X	X	X	X	X	X

Address	Content	Description		AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
			command word. If the bit is 0, the control command is ignored.								
		Bit 1	Island	X	X						
		Bit 1	DG supply						X	X	X
		Bit 2	Automatic mains failure (AMF)	X	X						
		Bit 2	SG supply						X	X	X
		Bit 3	Peak shaving	X	X						
		Bit 3	SHORE supply						X	X	X
		Bit 4	Fixed power	X	X		X	X			
		Bit 5	Mains power export (MPE)	X	X						
		Bit 5	SPLIT								X
		Bit 6	Load takeover (LTO)	X	X						
		Bit 6	Connect to DG supply								X
		Bit 7	Connect to SG supply								X
		Bit 8	Connect to SHORE supply								X
		Bit 9	MB/SG/SC/EDG-TB ON	X	X			X			
		Bit 10	MB/SG/SC/EDG-TB OFF	X	X			X			
		Bit 11	Auto start/stop	X	X						
		Bit 12	Manual mode	X							

Address	Content	Description	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
		Bit 13 Auto mode	X	X	X	X	X			
		Bit 14 Semi-auto mode	X	X	X	X	X			
		Bit 15 Test mode	X	X			X			
7		Bit 0 This bit must be 1 when writing the command word. If the bit is 0, the control command is ignored.	X	X	X	X	X	X	X	X
		Bit 1 External frequency control	X			X	X			
		Bit 2 External voltage control	X			X	X			
		Bit 3 External power control	X	X		X	X			
		Bit 4 External reactive power control	X			X	X			
		Bit 5 External power factor control	X			X	X			
		Bit 6								
		Bit 7								
		Bit 8								
		Bit 9 Application 1	X	X	X	X	X	X	X	X
		Bit 10 Application 2	X	X	X	X	X	X	X	X
		Bit 11 Application 3	X	X	X	X	X	X	X	X
		Bit 12 Application 4	X	X	X	X	X	X	X	X
		Bit 13 Battery test	X							

Address	Content	Description	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
		Bit 14 Event printer	X	X						
		Bit 15 Synchronise clock to 4:00 AM	X	X	X	X	X	X	X	X
8		Bit 0 This bit must be 1 when writing the command word. If the bit is 0, the control command is ignored								
		Bit 1 Virtual 1	X	X	X	X	X	X	X	X
		Bit 2 Virtual 2	X	X	X	X	X	X	X	X
		Bit 3 Virtual 3	X	X	X	X	X	X	X	X
		Bit 4 Virtual 4	X	X	X	X	X	X	X	X
		Bit 5 Virtual 5	X	X	X	X	X	X	X	X
		Bit 6 Virtual 6	X	X	X	X	X	X	X	X
		Bit 7 Virtual 7	X	X	X	X	X	X	X	X
		Bit 8 Virtual 8	X	X	X	X	X	X	X	X
		Bit 9 Virtual 9	X	X	X	X	X	X	X	X
		Bit 10 Virtual 10	X	X	X	X	X	X	X	X
		Bit 11 Virtual 11	X	X	X	X	X	X	X	X
		Bit 12 Virtual 12	X	X	X	X	X	X	X	X
		Bit 13 Virtual 13	X	X	X	X	X	X	X	X
		Bit 14 Virtual 14	X	X	X	X	X	X	X	X
		Bit 15 Virtual 15	X	X	X	X	X	X	X	X
9		Bit 0 This bit must be 1	X	X	X	X	X	X	X	X

Address	Content	Description	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
		when writing the command word. If the bit is 0, the control command is ignored.								
		Bit 1 Virtual 16	X	X	X	X	X	X	X	X
		Bit 2 Virtual 17	X	X	X	X	X	X	X	X
		Bit 3 Virtual 18	X	X	X	X	X	X	X	X
		Bit 4 Virtual 19	X	X	X	X	X	X	X	X
		Bit 5 Virtual 20	X	X	X	X	X	X	X	X
		Bit 6 Virtual 21	X	X	X	X	X	X	X	X
		Bit 7 Virtual 22	X	X	X	X	X	X	X	X
		Bit 8 Virtual 23	X	X	X	X	X	X	X	X
		Bit 9 Virtual 24	X	X	X	X	X	X	X	X
		Bit 10 Virtual 25	X	X	X	X	X	X	X	X
		Bit 11 Virtual 26	X	X	X	X	X	X	X	X
		Bit 12 Virtual 27	X	X	X	X	X	X	X	X
		Bit 13 Virtual 28	X	X	X	X	X	X	X	X
		Bit 14 Virtual 29	X	X	X	X	X	X	X	X
		Bit 15 Virtual 30	X	X	X	X	X	X	X	X
10		Bit 0 This bit must be 1 when writing the command word. If the bit is 0, the control command is ignored.	X	X	X	X	X	X	X	X

Address	Content	Description	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
		Bit 1 Virtual 31	X	X	X	X	X	X	X	X
		Bit 2 Virtual 32	X	X	X	X	X	X	X	X
11-13										
58000	Year	2003-2099	X	X	X	X	X	X	X	X
58001	Month	1-12	X	X	X	X	X	X	X	X
58002	Date	1-31	X	X	X	X	X	X	X	X

Address	Content	Description	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
58003	Day	1…7 (Monday…Sunday)	X	X	X	X	X	X	X	X
58004	Hour	0-23	X	X	X	X	X	X	X	X
58005	Min.	0-59	X	X	X	X	X	X	X	X
58006	Sec.	0-59	X	X	X	X	X	X	X	X

All control bits are automatically reset by the ML-2 unit except for 'Auto start/stop' (register 6, bit 11).

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

Address	Content	Description	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
0	Start		X			X	X			
1	GB ON		X			X	X			
	TB ON			X						
	BTB ON				X					X
2	GB OFF		X			X	X			
	TB OFF			X						
	BTB OFF				X					X
3	Stop		X			X	X			
4	Alarm inhibit 1		X	X	X	X	X	X	X	X
5	Alarm inhibit 2		X	X	X	X	X	X	X	X
6	Alarm inhibit 3		X	X	X	X	X	X	X	X
7	Reset analogue regulation outputs		X			X	X			
8										
9	Alarm ack.		X	X	X	X	X	X	X	X
10	Nominal setting 1		X	X	X	X	X	X	X	X
11	Nominal setting 2		X	X	X	X	X	X	X	X
12	Nominal setting 3		X	X	X	X	X	X	X	X
13	Nominal setting 4		X	X	X					
14	Start+sync (semi)					X	X			
15	Deload/stop (semi)					X	X			

Address	Content	Description	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
16	Island		X	X						
	DG supply							X	X	X
17	Automatic mains failure (AMF)		X	X						
	SG 1 supply							X	X	X
18	Peak shaving		X	X						
	SG 2 supply							X	X	X
19	Fixed power		X	X						
	SHORE supply							X	X	X
20	Mains power export (MPE)		X	X						
	SPLIT									X
21	Load takeover (LTO)		X	X						
22	DG supply									X
23	SG/SC supply									X
24	MB/SG/SC/EDG TB ON		X	X			X	X	X	
25	MB/SG/SC/EDG TB OFF		X	X			X	X	X	
26	Auto start/stop		X			X				
27	Manual mode		X							
28	Semi-auto mode		X			X	X			
29	Auto mode		X			X	X			
30	Test mode		X				X			
31	External frequency		X			X	X			

Address	Content	Description	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
	control									
32	External voltage control		X			X	X			
33	External power control		X			X	X			
34	External reactive power control		X			X	X			
35	External power factor control		X			X	X			
36										
37										
38										
39										
40										
41										
42										
43										
44	Battery test		X							
45	Event printer		X	X	X					
46	Synchronise clock to 4:00 a.m.		X	X	X	X	X	X	X	X
47										
48	Virtual event 1		X	X	X	X	X	X	X	X
49	Virtual event 2		X	X	X	X	X	X	X	X
50	Virtual event 3		X	X	X	X	X	X	X	X
51	Virtual event 4		X	X	X	X	X	X	X	X

Address	Content	Description	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
52	Virtual event 5		X	X	X	X	X	X	X	X
53	Virtual event 6		X	X	X	X	X	X	X	X
54	Virtual event 7		X	X	X	X	X	X	X	X
55	Virtual event 8		X	X	X	X	X	X	X	X
56	Virtual event 9		X	X	X	X	X	X	X	X
57	Virtual event 10		X	X	X	X	X	X	X	X
58	Virtual event 11		X	X	X	X	X	X	X	X
59	Virtual event 12		X	X	X	X	X	X	X	X
60	Virtual event 13		X	X	X	X	X	X	X	X
61	Virtual event 14		X	X	X	X	X	X	X	X
62	Virtual event 15		X	X	X	X	X	X	X	X
63	Virtual event 16		X	X	X	X	X	X	X	X
64	Virtual event 17		X	X	X	X	X	X	X	X
65	Virtual event 18		X	X	X	X	X	X	X	X
66	Virtual event 19		X	X	X	X	X	X	X	X
67	Virtual event 20		X	X	X	X	X	X	X	X
68	Virtual event 21		X	X	X	X	X	X	X	X
69	Virtual event 22		X	X	X	X	X	X	X	X
70	Virtual event 23		X	X	X	X	X	X	X	X
71	Virtual event 24		X	X	X	X	X	X	X	X
72	Virtual event 25		X	X	X	X	X	X	X	X
73	Virtual event 26		X	X	X	X	X	X	X	X
74	Virtual event 27		X	X	X	X	X	X	X	X

Address	Content	Description	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
75	Virtual event 28		X	X	X	X	X	X	X	X
76	Virtual event 29		X	X	X	X	X	X	X	X
77	Virtual event 30		X	X	X	X	X	X	X	X
78	Virtual event 31		X	X	X	X	X	X	X	X
79	Virtual event 32		X	X	X	X	X	X	X	X

All flags are automatically reset by the ML-2 unit except for 'Auto start/stop' (flag, address 26).

Status flags table (read only) (function code 02h)

Address	Content	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
0	GB position ON	X			X	X			
	TB position ON		X						
	BTB position ON			X					X
1	MB position ON	X	X						
	SGB position ON						X		
	SCB position ON							X	
	EDG-TB position ON					X			
2	Reserved								
3	Running	X			X	X	X		
4	Generator voltage/frequency OK	X			X	X	X	X	
5	Mains failure/Main busbar failure	X	X			X			
6	Block mode	X		X					
7	Manual mode	X							
	SWBD control				X	X	X	X	X
8	Semi-auto mode	X			X	X			
9	Auto mode	X			X	X			
10	Test mode	X	X			X			
11	Reserved								
12	Reserved								

Address	Content	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
13	Island	X	X						
	DG supply						X	X	X
14	Automatic mains failure (AMF)	X	X						
	SG 1 supply						X	X	X
15	Peak shaving	X	X						
	SG 2 supply						X	X	X
16	Fixed power	X	X						
	SHORE supply						X	X	X
17	Mains power export (MPE)	X	X						
	SPLIT								X
18	Load takeover (LTO)	X	X						
19	Power management	X		X					
20	Any alarm DG1	X	X	X	X	X	X	X	X
21	Any alarm DG2	X	X	X	X	X	X	X	X
22	Any alarm DG3	X	X	X	X	X	X	X	X
23	Any alarm DG4	X	X	X	X	X	X	X	X
24	Any alarm DG5	X	X	X	X	X	X	X	X
25	Any alarm DG6	X	X	X	X	X	X	X	X
26	Any alarm DG7	X	X	X	X	X	X	X	X
27	Any alarm DG8	X	X	X	X	X	X	X	X
28	Any alarm mains (Mains Command Unit)	X	X	X					

Address	Content	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB
29	Battery test	X				X			
30	Event printer	X							
31	Ready auto-start DG1	X			X				
32	Ready auto-start DG2	X			X				
33	Ready auto-start DG3	X			X				
34	Ready auto-start DG4	X			X				
35	Ready auto-start DG5	X			X				
36	Ready auto-start DG6	X			X				
37	Ready auto-start DG7	X			X				
38	Ready auto-start DG8	X			X				

Digital input table (read only 02h)

Addr.	Description	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB	Comments
22500	Digital input	97	97	97	97	97	97	97	97	
22501	Digital input	96	96	96	96	96	96	96	96	
22502	Digital input	95	95	95	95	95	95	95	95	
22503	Digital input	94	94	94	94	94	94	94	94	Option M13.6
22504	Digital input	93	93	93	93	93	93	93	93	
22505	Digital input	92	92	92	92	92	92	92	92	
22506	Digital input	91	91	91	91	91	91	91	91	
22507	Digital input	133	133	133	133	133	133	133	133	
22508	Digital input	132	132	132	132	132	132	132	132	
22509	Digital input	131	131	131	131	131	131	131	131	
22510	Digital input	130	130	130	130	130	130	130	130	Option M13.8
22511	Digital input	129	129	129	129	129	129	129	129	
22512	Digital input	128	128	128	128	128	128	128	128	
22513	Digital input	127	127	127	127	127	127	127	127	
22514										
22515										
22516										
22517										
22518										
22519										
22520										
22521										

Addr.	Description	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB	Comments
22522										
22523										
22524										
22525										
22526										
22527										
22528	Digital input	43	43	43	43	43	43	43	43	
22529	Digital input	44	44	44	44	44	44	44	44	
22530	Digital input	45	45	45	45	45	45	45	45	
22531	Digital input	46	46	46	46	46	46	46	46	
22532	Digital input	47	47	47	47	47	47	47	47	
22533	Digital input	48	48	48	48	48	48	48	48	AGC: Option M12
22534	Digital input	49	49	49	49	49	49	49	49	PPM: Std
22535	Digital input	50	50	50	50	50	50	50	50	
22536	Digital input	51	51	51	51	51	51	51	51	
22537	Digital input	52	52	52	52	52	52	52	52	
22538	Digital input	53	53	53	53	53	53	53	53	
22539	Digital input	54	54	54	54	54	54	54	54	
22540	Digital input	55	55	55	55	55	55	55	55	
22541	Digital input	23	23	23	23	23	23	23	23	
22542	Digital input	24	24	24	24	24	24	24	24	
22543	Digital input	25	25	25	25	25	25	25	25	Standard
22544	Digital input	26	26	26	26	26	26	26	26	
22545	Digital input	27	27	27	27	27	27	27	27	
22546										

Addr.	Description	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB	Comments
22547										
22548										
22549										
22550										
22551										
22552										
22553										
22554										
22555										
22556										
22557										
22558										
22559										
22560										
22561										
22562										
22563										
22564										
22565										
22566										
22567										
22568										
22569										
22570										
22571										

Addr.	Description	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB	Comments
22572										
22573										
22574										
22575										
22576										
22577										
22578										
22579										
22580										
22581										
22582										
22583	Digital input (Emer. stop)	118	118	118	118	118	118	118	118	Standard
22584	Digital input	117	117	117	117	117	117	117	117	
22585	Digital input	116	116	116	116	116	116	116	116	
22586	Digital input	115	115	115	115	115	115	115	115	
22587	Digital input	114	114	114	114	114	114	114	114	
22588	Digital input	113	113	113	113	113	113	113	113	
22589	Digital input	112	112	112	112	112	112	112	112	
22590	Stop coil superv. (M4)	123	123	123	123	123	123	123	123	
22591	Multi-func. input cable fail.	108	108	108	108	108	108	108	108	
22592	Multi-func. input cable fail.	105	105	105	105	105	105	105	105	
22593	Multi-func. input cable fail.	102	102	102	102	102	102	102	102	
22594	External digital input	1	1	1	1	1	1	1	1	Option H8

Addr.	Description	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB	Comments
22595	External digital input	2	2	2	2	2	2	2	2	
22596	External digital input	3	3	3	3	3	3	3	3	
22597	External digital input	4	4	4	4	4	4	4	4	
22598	External digital input	5	5	5	5	5	5	5	5	
22599	External digital input	6	6	6	6	6	6	6	6	
22600	External digital input	7	7	7	7	7	7	7	7	
22601	External digital input	8	8	8	8	8	8	8	8	
22602	External digital input	9	9	9	9	9	9	9	9	
22603	External digital input	10	10	10	10	10	10	10	10	
22604	External digital input	11	11	11	11	11	11	11	11	
22605	External digital input	12	12	12	12	12	12	12	12	
22606	External digital input	13	13	13	13	13	13	13	13	
22607	External digital input	14	14	14	14	14	14	14	14	
22608	External digital input	15	15	15	15	15	15	15	15	
22609	External digital input	16	16	16	16	16	16	16	16	

Digital output table (read only 01h)

Addr	Description	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB	Comments
23000	Relay	65	65	65	65	65				Option M14.4
23001	Relay	67	67	67	67	67				
23002	Relay	69	69	69	69	69				
23003	Relay	71	71	71	71	71				
23004	Relay	132	132	132	132	132	132	132	132	Option M14.8
23005	Relay	130	130	130	130	130	130	130	130	
23006	Relay	128	128	128	128	128	128	128	128	
23007	Relay	126	126	126	126	126	126	126	126	
23008	Relay	96	96	96	96	96	96	96	96	Option M14.6
23009	Relay	94	94	94	94	94	94	94	94	
23010	Relay	92	92	92	92	92	92	92	92	
23011	Relay	90	90	90	90	90	90	90	90	
23012										
23013										
23014										
23015										
23016	Relay	57	57	57	57	57	57	57	57	AGC: Option M12 PPM: Standard
23017	Relay	59	59	59	59	59	59	59	59	
23018	Relay	61	61	61	61	61	61	61	61	
23019	Relay	63	63	63	63	63	63	63	63	
23020										
23021										

Addr	Description	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB	Comments
23022										
23023										
23024										
23025	Relay	5	5	5	5	5	5	5	5	
23026	Relay	8	8	8	8	8	8	8	8	
23027	Relay	11	11	11	11	11	11	11	11	
23028	Relay	14	14	14	14	14	14	14	14	Standard
23029	Relay	17	17	17	17	17	17	17	17	
23030	Relay	T20	T20	T20	T20	T20	T20	T20	T20	
23031	Relay	T21	T21	T21	T21	T21	T21	T21	T21	
23032										
23033										
23034										
23035										
23036										
23037										
23038										
23039										
23040										
23041										
23042										
23043										
23044										
23045										
23046										

Addr	Description	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB	Comments
23047										
23048										
23049	Run. coil	X			X	X				Standard
23050	Start prepare	X			X	X				
23051	Start relay (crank)	X			X	X				
23052	Stop coil	X			X	X				
23053	LED PMS CAN	X	X	X	X	X	X	X	X	AGC: Option G5 PPM: Standard
23054	LED engine CAN	X			X	X				Option H5/H7
23055	LED USB	X	X	X	X	X	X	X	X	Standard
23056	External digital output	1	1	1	1	1	1	1	1	Option H8
23057	External digital output	2	2	2	2	2	2	2	2	
23058	External digital output	3	3	3	3	3	3	3	3	
23059	External digital output	4	4	4	4	4	4	4	4	
23060	External digital output	5	5	5	5	5	5	5	5	
23061	External digital output	6	6	6	6	6	6	6	6	
23062	External digital output	7	7	7	7	7	7	7	7	
23063	External digital output	8	8	8	8	8	8	8	8	
23064	External digital output	9	9	9	9	9	9	9	9	
23065	External digital output	10	10	10	10	10	10	10	10	
23066	External digital output	11	11	11	11	11	11	11	11	
23067	External digital output	12	12	12	12	12	12	12	12	
23068	External digital output	13	13	13	13	13	13	13	13	
23069	External digital output	14	14	14	14	14	14	14	14	
23070	External digital output	15	15	15	15	15	15	15	15	
23071	External digital output	16	16	16	16	16	16	16	16	

5. Parameter setting

Parameter 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/write 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
Enable	Parameter table	2000-3999

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

Function 02(02hex) 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
Alarm active	Parameter table	4000-5999
Alarm acknowledge	Parameter table	6000-7999
Timer output	Parameter table	8000-9999
Timer running	Parameter table	10000-11999

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
Timers used	Parameter table	2000-3999
Values used	Parameter table	4000-5999
Values minimum	Parameter table	6000-7999
Values maximum	Parameter table	8000-9999
Output a	Parameter table	10000-11999
Output b	Parameter table	12000-13999
Fail class used	Parameter table	14000-15999
Enable	Parameter table	16000-17999
Inhibit	Parameter table	18000-19999

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

Function 04(04hex) 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
Timers minimum	Parameter table	2000-3999
Timers maximum	Parameter table	4000-5999
Output a minimum	Parameter table	6000-7999
Output a maximum	Parameter table	8000-9999
Output b minimum	Parameter table	10000-11999
Output b maximum	Parameter table	12000-13999
Fail class minimum	Parameter table	14000-15999
Fail class maximum	Parameter table	16000-17999

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

Function 15(0Fhex) write multiple flags, function 5(05hex) write single flag

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
Enable	Parameter table	2000-3999
Ack. alarm	Parameter table	6000-7999

Function 16(10hex) write multiple register, function 6(06hex) write single register

Writes values into a sequence of registers.

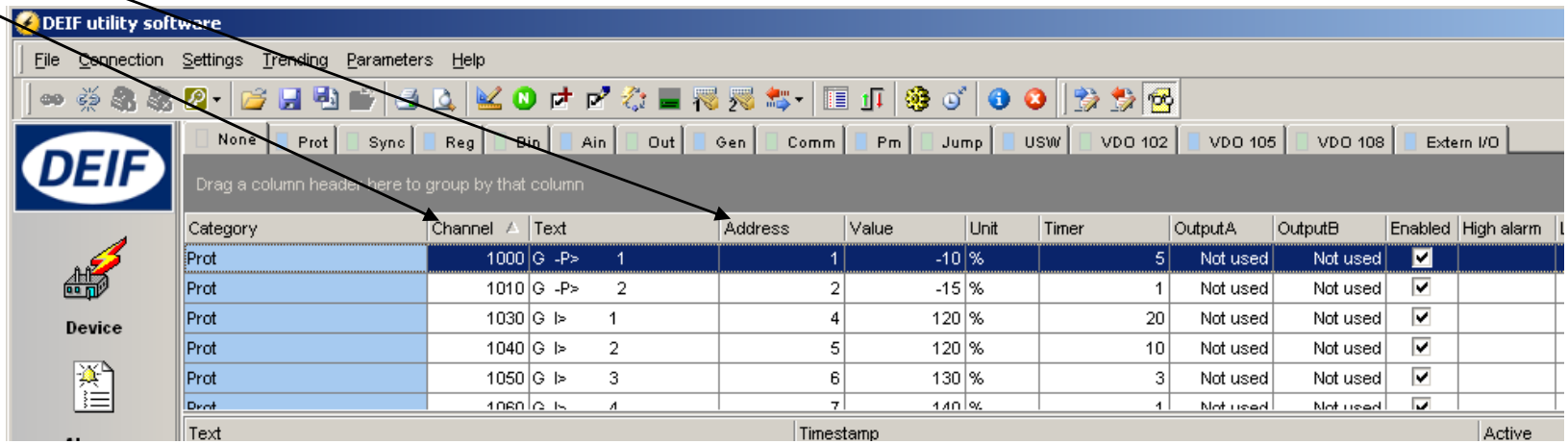
Address area for writing of registers

Multi-line 2 Data to request	Multi-line 2 Table	Address area
Timers used	Parameter table	2000-3999
Values used	Parameter table	4000-4999
Output a	Parameter table	10000-11999
Output b	Parameter table	12000-13999
Fail class used	Parameter table	14000-15999
Enable	Parameter table	16000-17999
Inhibit	Parameter table	18000-19999

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

Parameter addresses

Channel and Modbus address numbers can be found in the utility software parameter list for the unit in question.



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.

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