

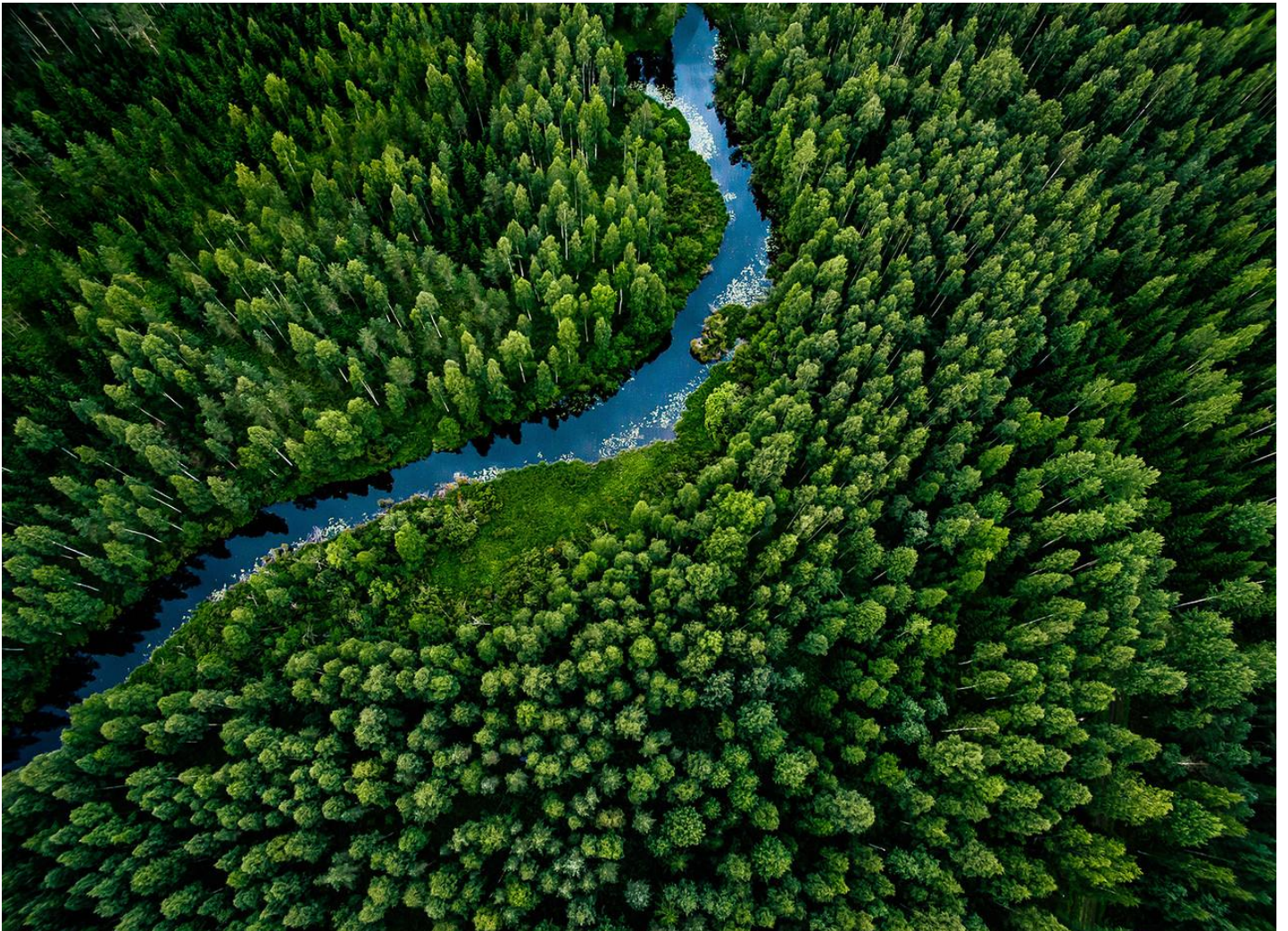
# Multi-line 2

Serial communication Profibus DP

**Option H3 serial communication Profibus DP**



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Tomorrow



<b>1.</b>	<b>Delimitation .....</b>	<b>3</b>
1.1	Scope of option H3 .....	3
<b>2.</b>	<b>General information .....</b>	<b>4</b>
2.1	Warnings, legal information and safety .....	4
2.1.1	Warnings and notes.....	4
2.1.2	Legal information and disclaimer .....	5
2.1.3	Safety issues.....	5
2.1.4	Electrostatic discharge awareness .....	6
2.1.5	Factory settings.....	6
<b>3.</b>	<b>Description of option .....</b>	<b>7</b>
3.1	Option H3 .....	7
<b>4.</b>	<b>Functional descriptions .....</b>	<b>8</b>
4.1	Transmission speed .....	8
4.2	Configuration and the GSD file.....	8
4.3	Data in/out.....	8
<b>5.</b>	<b>Parameters.....</b>	<b>9</b>
5.1	Parameters.....	9
<b>6.</b>	<b>Data tables .....</b>	<b>10</b>
6.1	Analogue values .....	10
6.2	Alarms .....	17
6.3	Multi-input – unscaled values .....	37
	Binary.....	40
6.4	Control register table (write only) .....	41

# 1. Delimitation

## 1.1 Scope of option H3

This description of options covers the following products:

AGC-4 Mk II	SW version 6.0x.x or later
AGC-4	SW version 4.0x.x or later
AGC-3	SW version 3.3x.x or later
GPC-3/GPU-3 Hydro	SW version 3.06.x or later
GPU-3/PPU-3	SW version 3.06.x or later
PPM-3	SW version 3.0x.x or later

## 2. General information

### 2.1 Warnings, legal information and safety

#### 2.1.1 Warnings and notes

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

##### Warnings



##### **This shows dangerous situations.**

If the guidelines are not followed, these situations will result in death, serious personal injury, and equipment damage or destruction.

##### Notes

**NOTE** Notes provide general information, which will be helpful for the reader to bear in mind.

### 2.1.2 Legal information and disclaimer

DEIF takes no responsibility for installation or operation of the generator set. If there is any doubt about how to install or operate the engine/generator controlled by the Multi-line 2 unit, the company responsible for the installation or the operation of the set must be contacted.

#### Warranty

#### NOTICE



#### Warranty

The Multi-line 2 unit is not to be opened by unauthorised personnel. If opened anyway, the warranty will be lost.

#### Disclaimer

DEIF A/S reserves the right to change any of the contents of this document without prior notice.

The English version of this document always contains the most recent and up-to-date information about the product. DEIF does not take responsibility for the accuracy of translations, and translations might not be updated at the same time as the English document. If there is a discrepancy, the English version prevails.

#### Copyright

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### 2.1.3 Safety during installation and operation

Installing and operating the Multi-line 2 unit may imply 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.



**DANGER!**



**Hazardous live currents and voltages.**

Do not touch any terminals, especially the AC measurement inputs and the relay terminals. Touching the terminals could lead to injury or death.

#### **2.1.4 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.

#### **2.1.5 Factory settings**

The unit is delivered from the factory with default settings. These are not necessarily correct for the engine/generator set. Check all the settings before running the engine/generator set.



## 3. Description of option

### 3.1 Option H3

Profibus is a vendor-independent, open field bus standard for a wide range of applications in manufacturing and process automation. Vendor-independence and openness are insured by the international standards EN 50170 and EN 50254.

The unit uses the communication profile “DP” (Decentralised Periphery).

#### Terminal description

##### NOTE

Terminals 29 and 32 are internally connected.  
Terminals 30 and 33 are internally connected.  
Terminals 31 and 34 are internally connected.

Terminal	Function	Description
29	DATA + (B)	Pin 3 on 9 pole sub-D connector Pin 5 on 9 pole sub-D connector Pin 8 on 9 pole sub-D connector
30	GND	
31	DATA - (A)	
32	DATA + (B)	
33	GND	
34	DATA - (A)	
35	Not used	
36	Not used	

## 4. Functional description

### 4.1 Transmission speed

Transmission speeds between 9.6 kbit/sec and 1500 kbit/sec are available.

### 4.2 Configuration and the GSD file

The GSD files “deif0632.gsd” and “deif0632.dib” are on the included CD. They can also be downloaded from our website **www.deif.com**. They are to be copied in the sub-paths **GSD** and **BITMAPS** of COM PROFIBUS. Then the Profibus network is ready to be configured.

The ID address is set in menu 7511.

### 4.3 Data in/out

61 words input and 13 words output are used. **Data in** is the input data from the unit to the Profibus master. **Data out** is the output data from Profibus master to the unit.



## 5. Parameters

### 5.1 Parameters

The option H3 relates to the parameters 7500-7511 and 7520.

For further information, please see the separate parameter list for the Multi-line unit in question:

Multi-line unit	Document number
AGC-4 Mk II	4189341273
AGC-3	4189340705
AGC-4	4189340688
GPC-3/GPU-3 Hydro	4189340580
GPU-3/PPU-3	4189340581
PPM-3	4189340672

## 6. Data tables

### 6.1 Analogue values

**NOTE**

Columns:

- "X" means standard feature.
- Empty box means not available.
- Number alone refers to a terminal

Address		Content	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB	PPU/GPC	GPU/GPU Hydro
0	U <sub>L1-L2</sub>	Generator voltage L1-L2 [V]	X		X	X	X	X			X	X
	U <sub>L1-L2</sub>	Mains voltage L1-L2 [V]		X								
	U <sub>L1-L2</sub>	Bus A voltage L1-L2 [V]								X		
	U <sub>L1-L2</sub>	Shore voltage L1-L2 [V]							X			
1	U <sub>L2-L3</sub>	Generator voltage L2-L3 [V]	X		X	X	X	X			X	X
	U <sub>L2-L3</sub>	Mains voltage L2-L3 [V]		X								
	U <sub>L2-L3</sub>	Bus A voltage L2-L3 [V]								X		
	U <sub>L2-L3</sub>	Shore voltage L2-L3 [V]							X			
2	U <sub>L3-L1</sub>	Generator voltage L3-L1 [V]	X		X	X	X	X			X	X

Address		Content	AGC	AGC mains	AGC bus tie	PPM DG	PPMEDG	PPM SHAFT	PPM SHORE	PPM BTB	PPU/GPC	GPU/GPU Hydro
	U <sub>L3-L1</sub>	Mains voltage L3-L1 [V]		X								
	U <sub>L3-L1</sub>	Bus A voltage L3-L1 [V]								X		
	U <sub>L3-L1</sub>	Shore voltage L3-L1 [V]							X			
3	U <sub>L1-N</sub>	Generator voltage L1-N [V]	X		X	X	X	X			X	X
	U <sub>L1-N</sub>	Mains voltage L1-N [V]		X								
	U <sub>L1-N</sub>	Bus A voltage L1-N [V]								X		
	U <sub>L1-N</sub>	Shore voltage L1-N [V]							X			
4	U <sub>L2-N</sub>	Generator voltage L2-N [V]	X		X	X	X	X			X	X
	U <sub>L2-N</sub>	Mains voltage L2-N [V]		X								
	U <sub>L2-N</sub>	Bus A voltage L2-N [V]								X		
	U <sub>L2-N</sub>	Shore voltage L2-N [V]							X			
5	U <sub>L3-N</sub>	Generator voltage L3-N [V]	X		X	X	X	X			X	X
	U <sub>L3-N</sub>	Mains voltage L3-N [V]		X								
	U <sub>L3-N</sub>	Bus A voltage L3-N [V]								X		
	U <sub>L3-N</sub>	Shore voltage L3-N [V]							X			
6	f <sub>L1</sub>	Generator f L1 [Hz/100]	X		X	X	X	X			X	X
	f <sub>L1</sub>	Mains f L1 [Hz/100]		X								
	f <sub>L1</sub>	Bus A f L1 [Hz/100]								X		
	f <sub>L1</sub>	Shore f L1 [Hz/100]							X			
7	I <sub>L1</sub>	Generator current L1 [A]	X		X	X	X	X			X	X

Address		Content	AGC	AGC mains	AGC bus tie	PPM DG	PPMEDG	PPM SHAFT	PPM SHORE	PPM BTB	PPU/GPC	GPU/GPU Hydro
	I <sub>L1</sub>	Mains current L1 [A]		X								
	I <sub>L1</sub>	Bus current L1 [A]								X		
	I <sub>L1</sub>	Shore current L1 [A]							X			
8	I <sub>L2</sub>	Generator current L2 [A]	X		X	X	X	X			X	X
	I <sub>L2</sub>	Mains current L2 [A]		X								
	I <sub>L2</sub>	Bus current L2 [A]								X		
	I <sub>L2</sub>	Shore current L2 [A]							X			
9	I <sub>L3</sub>	Generator current L3 [A]	X		X	X	X	X			X	X
	I <sub>L3</sub>	Mains current L3 [A]		X								
	I <sub>L3</sub>	Bus current L3 [A]								X		
	I <sub>L3</sub>	Shore current L3 [A]							X			
10	P <sub>GEN</sub>	Generator power [kW]	X		X	X	X	X			X	X
	P <sub>MAINS</sub>	Mains power [kW]		X								
	P <sub>BA</sub>	Bus power [kW]								X		
	P <sub>SC</sub>	Shore power [kW]							X			
11	Q <sub>GEN</sub>	Generator reactive power [kVAr]	X		X	X	X	X			X	X
	Q <sub>MAINS</sub>	Mains reactive power [kVAr]		X								
	Q <sub>BA</sub>	Bus reactive power [kVAr]								X		
	Q <sub>SC</sub>	Shore reactive power [kVAr]							X			
12	S <sub>GEN</sub>	Generator apparent power [kVA]	X		X	X	X	X			X	X
	S <sub>MAINS</sub>	Mains apparent power [kVA]		X								
	S <sub>BA</sub>	Bus apparent power [kVA]								X		

Address		Content		AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB	PPU/GPC	GPU/GPU Hydro
		S <sub>SC</sub>	Shore apparent power [kVA]							X			
13		Cos-phi	Generator PF [cosPhi/100]	X		X	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 <sub>GEN</sub>	Reactive energy counter [kVArh]	X			X	X	X			X	X
15	[Lo]			X			X	X	X			X	X
16	[Hi]	E <sub>GEN</sub>	Active energy counter [kWh]	X	X	X	X	X	X	X	X	X	X
17	[Lo]												
18		U <sub>BBL1-L2</sub>	U BB L1-L2 [V]	X	X	X	X	X	X	X		X	X
		U <sub>BBL1-L2</sub>	U BB B L1-L2 [V]								X		
19		U <sub>BBL2-L3</sub>	U BB L2-L3 [V]	X	X	X	X	X	X	X		X	X
		U <sub>BBL2-L3</sub>	U BB B L2-L3 [V]								X		
20		U <sub>BBL3-L1</sub>	U BB L3-L1 [V]	X	X	X	X	X	X	X		X	X
		U <sub>BBL3-L1</sub>	U BB B L3-L1 [V]								X		
21		U <sub>BBL1-N</sub>	U BB L1-N [V]	X	X	X	X	X	X	X		X	X
		U <sub>BBL1-N</sub>	U BB B L1-N [V]								X		
22		U <sub>BBL2-N</sub>	U BB L2-N [V]	X	X	X	X	X	X	X		X	X
		U <sub>BBL2-N</sub>	U BB B L2-N [V]								X		
23		U <sub>BBL3-N</sub>	U BB L3-N [V]	X	X	X	X	X	X	X		X	X
		U <sub>BBL3-N</sub>	U BB B L3-N [V]								X		
24		F <sub>BB</sub>	BB f L1 [Hz/100]	X	X	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	PPU/GPC	GPU/GPU Hydro
			BB B f L1 [Hz/100]								X		
25		PHIBBL1-L2	U BB phase angle L1-L2 [Deg/10]	X	X	X	X	X	X	X	X	X	X
26		PHIBBL1-DGL1	U BB L1 - U GEN L1 phase angle [Deg/10]	X		X	X	X	X	X		X	X
		PHIBBL1-ML1	U BB L1 - U Mains L1 phase angle [Deg/10]		X								
		PHIBAL1-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	X	X
28		Alarms	No. of unack. alarms	X	X	X	X	X	X	X	X	X	X
29		Start attempts	Start attempts	X			X	X				X	X
30	[Hi]	Abs. run. hours	Abs. run hours	X			X	X	X			X	X
31	[Lo]												
32		GBoper	No. of GB operations	X		X	X	X	X			X	X
		TBoper	No. of TB operations		X	X							
		BTBoper	No. of BTB operations								X		
		SCBoper	No. of SCB operations							X			
33		MBoper	No. of MB operations	X	X								
		TBoper	No. of TB operations					X					
34		USUPPLY	DC supply term. 1-2 [V/10]	X	X	X	X	X	X	X	X	X	X
35		USUPPLY M4	DC supply term. 98-99 [V/10]	X	X	X	X	X	X	X	X	X	X
36		RPM	RPM	X		X	X	X	X			X	X

Address		Content	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB	PPU/GPC	GPU/GP U
37		Multi-input 102 unscaled	X	X	X	X	X	X	X	X	X
38		Multi-input 105 unscaled	X	X	X	X	X	X	X	X	X
39		Multi-input 108 unscaled	X	X	X	X	X	X	X	X	X
40		Control register address 0	X	X	X	X	X	X	X	X	X
41		Control register address 1	X	X	X	X	X	X	X	X	X
42		Control register address 2	X	X	X	X	X	X	X	X	X
43		Control register address 3	X	X	X	X	X	X	X	X	X
44		Control register address 4	X	X	X	X	X	X	X	X	X
45		Control register address 5	X	X	X	X	X	X	X	X	X
46		Control register address 6	X	X	X	X	X	X	X		
	0	SWBD mode								X	X
	1	Fixed frequency								X	X
	2	Fixed P								X	
	3	P load sharing								X	
	4	Frequency droop								X	
	5	Ext. GOV setpoint								X	X
	6	Fixed voltage								X	X
	7	Fixed Q								X	
	8	Fixed PF								X	
	9	Q load sharing								X	
	10	Voltage droop								X	
	11	Ext. AVR setpoint								X	X
	12	Remote								X	X
	13	Local								X	X
	14	Deload								X	X



Address		Content	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB	PPU/GPC	GPU/GP U
	15	Start sync./control									X	X
47		Control register address 7	X	X	X	X	X	X	X	X	X	X

## 6.2 Alarms

Address	Bit	Parameter	Content	AGC	AGC mains	AGC bus tie	PPMDG	PPMEDG	PPM SHAFT	PPM SHORE	PPM BTB	PPU/GPC	GPU/GPU Hydro	
48	<b>Generator/mains/busbar 1/shore connection</b>													
	0	1000	G -P> 1	X			X	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			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			X	X
			M I> 1		X									
			BTB I> 1			X						X		
			SC I> 1								X			
	4	1040	G I> 2	X				X	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				X	X

Address	Bit	Parameter	Content	AGC	AGC mains	AGC bus tie	PPMDG	PPMEDG	PPM SHAFT	PPM SHORE	PPM BTB	PPU/GPC	GPU/GPU Hydro	
			MI > 3		X									
			BTB I > 3			X					X			
			SC I > 3							X				
	6	1060	GI > 4	X			X	X	X				X	X
			MI > 4		X									
			BTB I > 4			X						X		
			SC I > 4							X				
	7	1090	Reserved											
	8	1120	Reserved											
	9	1130	GI >> 1	X			X	X	X				X	X
			MI >> 1		X									
			BTB I >> 1			X						X		
			SC I >> 1							X				
	10	1140	GI >> 2	X			X	X	X				X	X
			MI >> 2		X									
			BTB I >> 2			X						X		
SC I >> 2									X					
11	1150	GU > 1	X			X	X	X				X	X	
		MU > 1		X										
		BB-A U > 1			X						X			
		SC U > 1							X					

Address	Bit	Parameter	Content	AGC	AGC mains	AGC bus tie	PPMDG	PPMEDG	PPMSHAFT	PPMSHORE	PPMBTB	PPU/GPC	GPU/GPU Hydro	
	12	1160	G U> 2	X			X	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				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				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				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			X	X	
			M f> 1		X									
			B1 f> 1			X						X		
			SC f> 1								X			
	1	1220	G f> 2	X			X	X	X			X	X	

Address	Bit	Parameter	Content	AGC	AGC mains	AGC bus tie	PPMDG	PPMEDG	PPM SHAFT	PPM SHORE	PPM BTB	PPU/GPC	GPU/GPU Hydro
			M f> 2		X								
			BB-A f> 2			X					X		
			SC f> 2							X			
	2	1230	G f> 3	X			X	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		X	X
			M f< 1		X								
			BB-A f< 1			X					X		
	4	1250	G f< 2	X			X	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			X	X
			M f< 3		X								
			BB-A f< 3			X					X		
			SC f< 3							X			
		<b>Busbar/mains</b>											
	6	1270	BB U> 1	X	X	X	X	X	X	X		X	X
			BB-B U> 1								X		

Address	Bit	Parameter	Content	AGC	AGC mains	AGC bus tie	PPMDG	PPMEDG	PPM SHAFT	PPM SHORE	PPM BTB	PPU/GPC	GPU/GPU Hydro
	7	1280	BB U> 2	X	X	X	X	X	X	X		X	X
			BB-B U> 2								X		
	8	1290	BB U> 3	X	X	X	X	X	X	X		X	X
			BB-B U> 3								X		
	9	1300	BB U< 1	X	X	X	X	X	X	X		X	X
			BB-B U< 1								X		
	10	1310	BB U< 2	X	X	X	X	X	X	X		X	X
			BB-B U< 2								X		
	11	1320	BB U< 3	X	X	X	X	X	X	X		X	X
			BB-B U< 3								X		
	12	1330	BB U< 4	X	X	X	X	X	X	X		X	X
			BB-B U< 4								X		
	13	1350	BB f> 1	X	X	X	X	X	X	X		X	X
			BB-B f> 1								X		
	14	1360	BB f> 2	X	X	X	X	X	X	X		X	X
			BB-B f> 2								X		
	15	1370	BB f> 3	X	X	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		X	X
			BB-B f< 1								X		
	1	1390	BB f< 2	X	X	X	X	X	X		X	X	



Address	Bit	Parameter	Content	AGC	AGC mains	AGC bus tie	PPMDG	PPMEDG	PPMSHAFT	PPMSHORE	PPMBTB	PPUGPC	GPU/GPU Hydro
			BB-B f< 2								X		
	2	1400	BB f< 3	X	X	X	X	X	X	X		X	X
			BB-B f< 3								X		
	3	1410	BB f< 4	X	X	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							
<b>Generator/mains/busbar A/shore</b>													
	7	1450	G P> 1	X			X	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			X	X
			M P> 2		X								
			BA P> 2			X					X		
			SC P> 2							X			
	9	1470	G P> 3	X			X	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	PPU/GPC	GPU/GPU Hydro	
	10	1480	G P> 4	X			X	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				X	X
			M P> 5		X									
			BA P> 5			X						X		
			SC P> 5								X			
	12		Unbalance curr.	X	X		X	X	X	X		X	X	
	13		Unbalance volt.	X	X		X	X	X	X		X	X	
	14	1520	G -Q>	X			X	X	X				X	X
			M -Q>		X									
			BA -Q>			X						X		
			SC -Q>								X			
	15	1530	G Q>	X			X	X	X				X	X
			M Q>		X									
BA Q>					X						X			
SC Q>										X				
51	<b>Synchronising</b>													
	0	2120	Synchronising window	X	X	X	X	X	X	X	X	X	X	
	1	2130	Synchronising failure GB	X			X	X				X	X	

Address	Bit	Parameter	Content	AGC	AGC mains	AGC bus tie	PPMDG	PPMEDG	PPM SHAFT	PPM SHORE	PPM BTB	PPU/GPC	GPU/GPU Hydro
			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	X	X
	4	2160	GB open failure	X			X	X				X	X
			TB open failure		X								
			BTB open failure			X					X		
	5	2170	GB close failure	X			X	X				X	X
			TB close failure		X								
			BTB close failure			X					X		
	6	2180	GB pos. failure	X			X	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	PPMDG	PPMEDG	PPM SHAFT	PPM SHORE	PPM BTB	PPU/GPC	GPU/GPU Hydro
			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	2190	Vector mismatch									X	X
	12	2320	BTB A pos. failure									X	X
	13	2330	BTB B pos. failure									X	X
	14	2340	BTB C pos. failure									X	X
	15	2350	BTB D pos. failure									X	X
52	<b>Digital alarms</b>												
	0	3130	Digital alarm input	43	43	43	43	43	43	43	43	43	43
	1	3140	Digital alarm input	44	44	44	44	44	44	44	44	44	44
	2	3150	Digital alarm input	45	45	45	45	45	45	45	45	45	45
	3	3160	Digital alarm input	46	46	46	46	46	46	46	46	46	46
	4	3170	Digital alarm input	47	47	47	47	47	47	47	47	47	47
	5	3180	Digital alarm input	48	48	48	48	48	48	48	48	48	48
	6	3190	Digital alarm input	49	49	49	49	49	49	49	49	49	49
	7	3200	Digital alarm input	50	50	50	50	50	50	50	50	50	50

Address	Bit	Parameter	Content	AGC	AGC mains	AGC bus tie	PPMDG	PPMEDG	PPM SHAFT	PPM SHORE	PPM BTB	PPU/GPC	GPU/GPU Hydro	
	8	3210	Digital alarm input	51	51	51	51	51	51	51	51	51	51	
	9	3220	Digital alarm input	52	52	52	52	52	52	52	52	52	52	
	10	3230	Digital alarm input	53	53	53	53	53	53	53	53	53	53	
	11	3240	Digital alarm input	54	54	54	54	54	54	54	54	54	54	
	12	3250	Digital alarm input	55	55	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	91	91	91
	8	3340	Digital alarm input	92	92	92	92	92	92	92	92	92	92	92
	9	3350	Digital alarm input	93	93	93	93	93	93	93	93	93	93	93
	10	3360	Digital alarm input	94	94	94	94	94	94	94	94	94	94	94
	11	3370	Digital alarm input	95	95	95	95	95	95	95	95	95	95	95
12	3380	Digital alarm input	96	96	96	96	96	96	96	96	96	96	96	

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

Address	Bit	Parameter	Content	AGC	AGC mains	AGC bus tie	PPMDG	PPMEDG	PPM SHAFT	PPM SHORE	PPM BTB	PPU/GPC	GPU/GPU Hydro
	1	3510	Digital alarm input	128	128	128	128	128	128	128	128	128	128
	2	3520	Digital alarm input	129	129	129	129	129	129	129	129	129	129
	3	3530	Digital alarm input	130	130	130	130	130	130	130	130	130	130
	4	3540	Digital alarm input	131	131	131	131	131	131	131	131	131	131
	5	3550	Digital alarm input	132	132	132	132	132	132	132	132	132	132
	6	3560	Digital alarm input	133	133	133	133	133	133	133	133	133	133
	7												
	8												
	9												
	10												
	11												
	12												
	13												
	14												
	15												
<b>Analogue input alarm</b>													
56	0	4000	4-20 mA	91.1	91.1	91.1	91.1	91.1	91.1	91.1	91.1	91.1	91.1
	1	4010	4-20 mA	91.2	91.2	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	91	91
	3	4030	4-20 mA	93.1	93.1	93.1	93.1	93.1	93.1	93.1	93.1	93.1	93.1
	4	4040	4-20 mA	93.2	93.2	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	PPMDG	PPMEDG	PPM SHAFT	PPM SHORE	PPM BTB	PPU/GPC	GPU/GPU Hydro
	5	4050	Wire failure analogue	93	93	93	93	93	93	93	93	93	93
	6	4060	4-20 mA	95.1	95.1	95.1	95.1	95.1	95.1	95.1	95.1	95.1	95.1
	7	4070	4-20 mA	95.2	95.2	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	95	95
	9	4090	4-20 mA	97.1	97.1	97.1	97.1	97.1	97.1	97.1	97.1	97.1	97.1
	10	4100	4-20 mA	97.2	97.2	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	97	97
	12												
	13												
	14												
	15												
	<b>Multi-functional input</b>												
57	0	4120	4-20 mA	102.1	102.1	102.1	102.1	102.1	102.1	102.1	102.1	102.1	102.1
	1	4130	4-20 mA	102.2	102.2	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	102.1	102.1
	1	4150	V DC	102.2	102.2	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	102.1	102.1

1	4170	Pt	102 .2	102.2	102.2	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	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	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	102.1	102.1	102.1

Address	Bit	Parameter	Content	AGC	AGC mains	AGC bus tie	PPMDG	PPMEDG	PPM SHAFT	PPM SHORE	PPM BTB	PPU/GPC	GPU/GPU Hydro
	1	4210	VDO water	102.2	102.2	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	102.1	102.1
	1	4230	VDO fuel	102.2	102.2	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	102	102
	3	4250	4-20 mA	105.1	105.1	105.1	105.1	105.1	105.1	105.1	105.1	105.1	105.1
	4	4260	4-20 mA	105.2	105.2	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	105.1	105.1
	4	4280	V DC	105.2	105.2	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	105.1	105.1
	4	4300	Pt	105.2	105.2	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	105.1	105.1
	4	4320	VDO oil	105.2	105.2	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	105.1	105.1
	4	4340	VDO water	105.2	105.2	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	105.1	105.1
	4	4360	VDO fuel	105.2	105.2	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	105	105
	6	4380	4-20 mA	108.1	108.1	108.1	108.1	108.1	108.1	108.1	108.1	108.1	108.1
	7	4390	4-20 mA	108.2	108.2	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	108.1	108.1
	7	4410	V DC	108.2	108.2	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	PPMDG	PPMEDG	PPM SHAFT	PPM SHORE	PPM BTB	PPU/GPC	GPU/GPU Hydro
	6	4420	Pt	108.1	108.1	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	108.2	108.2
	6	4440	VDO oil	108.1	108.1	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	108.2	108.2
	6	4460	VDO water	108.1	108.1	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	108.2	108.2
	6	4480	VDO fuel	108.1	108.1	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	108.2	108.2
	8	4500	Wire failure	108	108	108	108	108	108	108	108	108	108
	<b>Analogue input alarm</b>												
	9	4510	Oversp. 1	X			X	X	X			X	X
	10	4520	Oversp. 2	X			X	X	X			X	X
	11	4530	Crank failure	X			X	X				X	X
	12	4540	Running feedback failure	X			X	X				X	X
	13	4550	MPU wire failure	X			X	X				X	X
	14	4560	Hz/V failure	X			X	X	X	X		X	X
	15	4570	Start failure	X			X	X				X	X
	<b>Output</b>												
58	0	5000	Relay	5	5	5	5	5	5	5	5	5	5
	1	5010	Relay	8	8	8	8	8	8	8	8	8	8
	2	5020	Relay	11	11	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	PPU/GPC	GPU/GPU Hydro	
	3	5030	Relay	14	14	14	14	14	14	14	14	14	14	
	4	5040	Relay	17	17	17	17	17	17	17	17	17	17	
	5	5050	Relay	T20	T20	T20	T20	T20	T20	T20	T20	T20	T20	
	6	5060	Relay	T21	T21	T21	T21	T21	T21	T21	T21	T21	T21	
	7	5070	Relay	29	29	29	29	29	29	29	29	29	29	
	8	5080	Relay	31	31	31	31	31	31	31	31	31	31	
	9	5090	Relay	33	33	33	33	33	33	33	33	33	33	
	10	5100	Relay	35	35	35	35	35	35	35	35	35	35	
	11	5110	Relay	57	57	57	57	57	57	57	57	57	57	
	12	5120	Relay	59	59	59	59	59	59	59	59	59	59	
	13	5130	Relay	61	61	61	61	61	61	61	61	61	61	
	14	5140	Relay	63	63	63	63	63	63	63	63	63	63	
	15													
	<b>General</b>													
	59	0		Block mode	X		X							
1			Manual mode	X								X	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	PPMDG	PPMEDG	PPM SHAFT	PPM SHORE	PPM BTB	PPU/GPC	GPU/GPU Hydro
	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							
			Genset group		X								
	12		DG supply						X	X			
	13		SG/SC supply						X	X			
	14		Reserved										
	15		AMF active	X	X								
60	<b>EIC alarm</b>												
	0	7570	Communication error	X			X	X	X	X	X	X	X
	1	7580	Warning	X			X	X	X			X	X
	2	7590	Shutdown	X			X	X	X			X	X
	3	7600	Overspeed	X			X	X	X			X	X
	4	7610	Cool water temp. high 1	X			X	X	X			X	X
	5	7620	Cool water temp. high 2	X			X	X	X			X	X
	6	7630	Oil pressure low 1	X			X	X	X			X	X
	7	7640	Oil pressure low 2	X			X	X	X			X	X
	8	7650	Oil temp. 1	X			X	X	X			X	X

Address	Bit	Parameter	Content	AGC	AGC mains	AGC bus tie	PPMDG	PPMEDG	PPM SHAFT	PPM SHORE	PPM BTB	PPU/GPC	GPU/GPU Hydro
	9	7660	Oil temp. 2	X			X	X	X			X	X
	10	7670	Coolant level 1	X								X	X
	11	7680	Coolant level 2	X								X	X
	12												
	13												
	14												
	15												

## 6.3 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 corresponding addresses in the measurement table are 37, 38, 39.

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

### **4-20 mA**

0 mA: 0 bit

4 mA: 170 bit

20 mA: 853 bit

25 mA: 1023 bit

Linearity between the unscaled value and the scaled value yields.

### **0-40 V 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:

$$\Omega = (x + 509) * 100/771$$

x: Unscaled value.

$\Omega$ : Pt resistance value.

## **Pt1000**

Linearity between the unscaled value and the input resistance yields according to the

following equation:  $\Omega = (x + 519) * 10/79$

x: Unscaled value.

$\Omega$ : 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 90.0 Ω:**

$$\Omega = ((x * 1000) + 300)/10330$$

x: Unscaled value.

Ω: VDO resistance value.

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

$$\Omega = ((x * 1000) - 800)/5160$$

x: Unscaled value.

Ω: VDO resistance value.

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

$$\Omega = ((x * 1000) + 1000)/2070$$

x: Unscaled value.

Ω: VDO resistance value.

**If maximum resistance on the sensor is above 490.0 Ω:**

$$\Omega = ((x * 1000) + 294)/520$$

x: Unscaled value.

$\Omega$ : VDO resistance value

### **Binary**

Input high: < 50 bit

Input low:  $\geq$  50bit

Cable failure: > 950 bit

### **NOTE**

**It is recommended to use the scaled values for Pt100/1000 and VDO readings.**

## 6.4 Control register table (write only)

Address	Content	Description	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB	PPU/GPC	GPU/GPU Hydro	
0	Power regulator setpoint	0...100% of nominal power. Activated in menu 7501	X	X		X	X				X	X	
1	PF regulator setpoint	60...100 stated as PF value/100. The value 100 means PF = 1. Activated in menu 7504	X			X	X				X	X	
2	Reactive power regulator setpoint	+/-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				X	X	
3	Frequency regulator setpoint	+/-100% corresponding to +/- 10.0% of nominal frequency. Activated in menu 7502	X			X	X				X	X	
4	Voltage regulator setpoint	+/-100% corresponding to +/- 10.0% of nominal voltage. Activated in menu 7503	X			X	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	
		Bit 1	Remote start	X			X	X				X	X
		Bit 2	Remote GB ON	X			X	X				X	X

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

Address	Content	Description	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB	PPU/GPC	GPU/GPU Hydro
Bit 1		Island	X	X				X	X	X		
Bit 2		DG supply										
Bit 3		Automatic mains failure (AMF)	X	X								
Bit 4		SG supply						X	X	X		
Bit 5		Peak shaving	X	X								
Bit 6		SHORE supply						X	X	X		
Bit 7		Fixed power	X	X		X	X					
Bit 8		Mains power export (MPE)	X	X								
Bit 9		SPLIT								X		
Bit 10		Load takeover (LTO)	X	X								
Bit 11		Connect to DG supply								X		
Bit 12		Connect to SG supply								X		
Bit 13		Connect to SHORE suppl								X		
Bit 14		MB//SG/SC/EDG-TB ON	X	X			X					
Bit 15		MB//SG/SC/EDG-TB OF	X	X			X					
Bit 16		Auto start/stop	X	X								
Bit 17		Manual mode	X								X	X
Bit 18		Auto mode	X	X	X	X	X					
Bit 19		Semi-auto mode	X	X	X	X	X					
Bit 20		Test mode	X	X			X					

Address	Content	Description	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB	PPU/GPC	GPU/GPU Hydro
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	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	Capacitive PF	X	X							X	
	Bit 7	Base load	X			X						
	Bit 8	1. priority	X	X		X						
	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									
	Bit 14	Event printer	X	X								
Bit 15	Synchronise clock to 4:00 AM	X	X	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	X	X	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	PPU/GPC	GPU/GPU Hydro
		command is ignored.										
		Bit 1 Virtual 1	X	X	X	X	X	X	X	X	X	X
		Bit 2 Virtual 2	X	X	X	X	X	X	X	X	X	X
		Bit 3 Virtual 3	X	X	X	X	X	X	X	X	X	X
		Bit 4 Virtual 4	X	X	X	X	X	X	X	X	X	X
		Bit 5 Virtual 5	X	X	X	X	X	X	X	X	X	X
		Bit 6 Virtual 6	X	X	X	X	X	X	X	X	X	X
		Bit 7 Virtual 7	X	X	X	X	X	X	X	X	X	X
		Bit 8 Virtual 8	X	X	X	X	X	X	X	X	X	X
		Bit 9 Virtual 9	X	X	X	X	X	X	X	X	X	X
		Bit 10 Virtual 10	X	X	X	X	X	X	X	X	X	X
		Bit 11 Virtual 11	X	X	X	X	X	X	X	X	X	X
		Bit 12 Virtual 12	X	X	X	X	X	X	X	X	X	X
		Bit 13 Virtual 13	X	X	X	X	X	X	X	X	X	X
		Bit 14 Virtual 14	X	X	X	X	X	X	X	X	X	X
		Bit 15 Virtual 15	X	X	X	X	X	X	X	X	X	X
9		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	X	X
		Bit 1 Virtual 16	X	X	X	X	X	X	X	X	X	X
		Bit 2 Virtual 17	X	X	X	X	X	X	X	X	X	X
		Bit 3 Virtual 18	X	X	X	X	X	X	X	X	X	X
		Bit 4 Virtual 19	X	X	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	PPU/GPC	GPU/GPU Hydro	
		Bit 5 Virtual 20	X	X	X	X	X	X	X	X	X	X	
		Bit 6 Virtual 21	X	X	X	X	X	X	X	X	X	X	X
		Bit 7 Virtual 22	X	X	X	X	X	X	X	X	X	X	X
		Bit 8 Virtual 23	X	X	X	X	X	X	X	X	X	X	X
		Bit 9 Virtual 24	X	X	X	X	X	X	X	X	X	X	X
		Bit 10 Virtual 25	X	X	X	X	X	X	X	X	X	X	X
		Bit 11 Virtual 26	X	X	X	X	X	X	X	X	X	X	X
		Bit 12 Virtual 27	X	X	X	X	X	X	X	X	X	X	X
		Bit 13 Virtual 28	X	X	X	X	X	X	X	X	X	X	X
		Bit 14 Virtual 29	X	X	X	X	X	X	X	X	X	X	X
		Bit 15 Virtual 30	X	X	X	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	X	X	
		Bit 1 Virtual 31	X	X	X	X	X	X	X	X	X	X	X
		Bit 2 Virtual 32	X	X	X	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	PPU/GPC	GPU/GPU Hydro
11		Bit 0 This bit must be 1 when writing the command word. If the bit is 0, the control command is ignored.									X	X
		Bit 1 Fixed frequency									X	
		Bit 2 Fixed P									X	
		Bit 3 P load sharing									X	
		Bit 4 Frequency droop									X	
		Bit 5 Ext. GOV setpoint									X	
		Bit 6 Fixed voltage									X	
		Bit 7 Fixed Q									X	
		Bit 8 Fixed PF									X	
		Bit 9 Q load sharing									X	
		Bit 10 Voltage droop									X	
		Bit 11 Ext. AVR setpoint									X	
		Bit 12 Remote									X	X
		Bit 13 Local									X	X
		Bit 14 Deload									X	X

Address	Content	Description	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB	PPU/GPC	GPU/GPU Hydro	
		Bit 15 Start sync./control									X	X	
12		Bit 0 This bit must be 1 when writing the command word. If the bit is 0, the control command is ignored.											
		Bit 1 Manual GOV up									X	X	
		Bit 2 Manual GOV down									X	X	
		Bit 3 Manual AVR up									X	X	
		Bit 4 Manual AVR down									X	X	
		Bit 5 Activate CANshare section 1									X	X	
		Bit 6 Activate CANshare section 2									X	X	
		Bit 7 Activate CANshare section 3									X	X	
		Bit 8 Activate CANshare section 4									X	X	
		Bit 9 Activate CANshare section 5									X	X	
		Bit 10 Reserved											
		Bit 11 Reserved											
		Bit 12 Reserved											

Address	Content	Description	AGC	AGC mains	AGC bus tie	PPM DG	PPM EDG	PPM SHAFT	PPM SHORE	PPM BTB	PPU/gpc	GPU/GPU Hydro
		Bit 13 Reserved										
		Bit 14 Reserved										
		Bit 15 Reserved										

**NOTE**

Please note that all control commands are ignored as long as the value sent to address 1 (Power Factor setpoint) is outside the valid data range between 60 and 100.

DEIF A/S reserves the right to change any of the above.