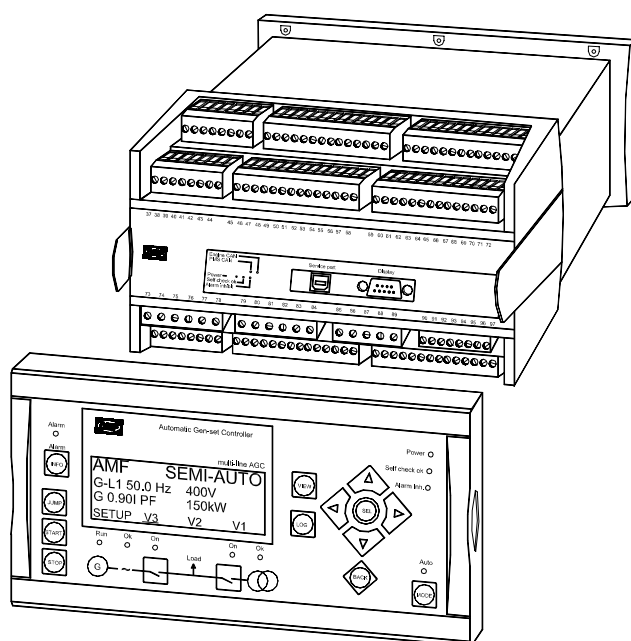


4189340443A
SW version 3.0X.X



- *Description of option*
- *Functional description*
- *Parameter list*
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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.
Profibus DP slave communication	-

H3 option

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).

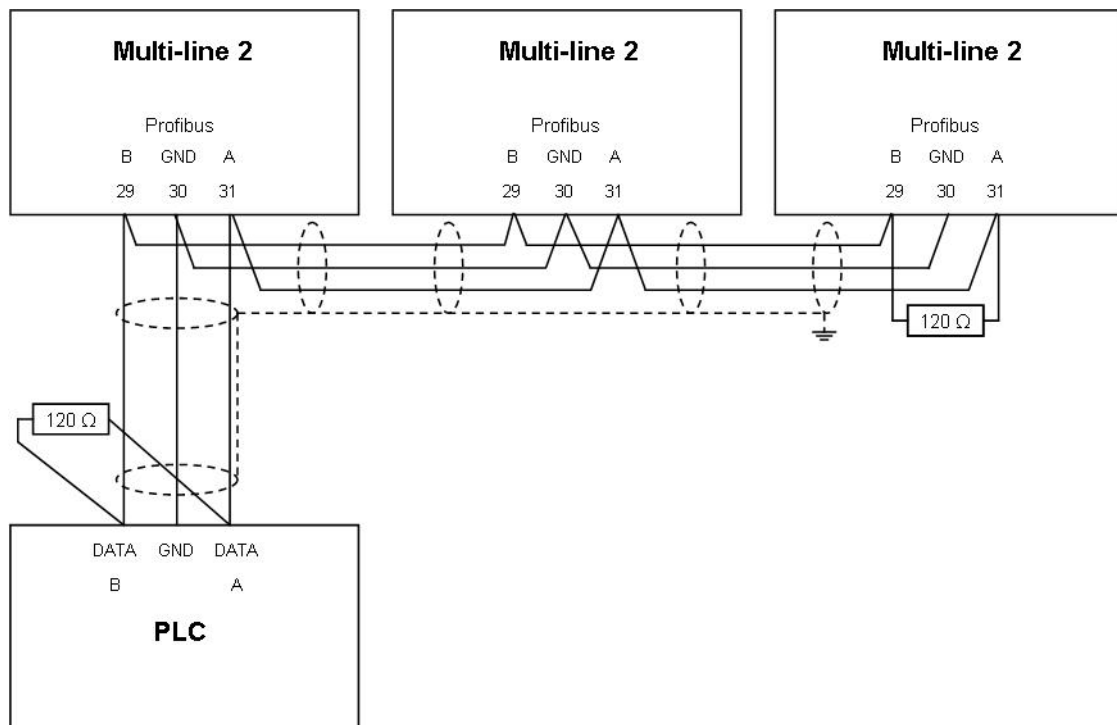
Terminal description

Term.	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	



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

Wiring diagram



- i** The serial communication line should be terminated between DATA A and DATA B with a resistor equal to the cable impedance. However, in most cases a 120Ω resistor can be used.
- i** Do not connect the cable shield to the GND terminal on the ML-2 unit.
- i** On the drawing terminals 29, 30 and 31 are used, however terminals 32, 33 and 34 might as well be used.
- i** Cable: Belden 3105A or equivalent. 22 AWG (0.6 mm²) single twisted pair, shielded, <40 mΩ / m, min. 95% shield coverage.

3. Functional description

Transmission speed

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

Baud rate (kbit/s)	9.6	19.2	93.75	187.5	500	1500
Range/segment	1200 m	1200 m	1200 m	1000 m	400 m	200 m

Up to 32 stations (master or slaves) can be connected in one segment. The Baud rate is automatically identified by the controller unit.

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.

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.

4. Parameter list

7500 Comm. control

No.	Setting		Min. setting	Max. setting	Factory setting
7501	Comm. control	Power	OFF	ON	OFF
7502	Comm. control	Frequency	OFF	ON	OFF
7503	Comm. control	Voltage	OFF	ON	OFF
7504	Comm. control	PF	OFF	ON	OFF
7505	Comm. control	Reactive power	OFF	ON	OFF



Selecting communication control ON will overrule external and internal settings.



Voltage, PF and reactive power control requires option D1.

7511 Ext. comm. ID

No.	Setting		Min. setting	Max. setting	Factory setting
7511	Ext. comm. ID	ID	1	247	3

The Baud rate is automatically changed with profibus communication.

7520 Ext. comm. error

No.	Setting		Min. setting	Max. setting	Factory setting
7521	Ext. comm. error	Delay	1.0 s	100.0 s	10.0 s
7522	Ext. comm. error	Relay output A	Not used	Option dependent	Not used
7523	Ext. comm. error	Relay output B	Not used		Not used
7524	Ext. comm. error	Enable	OFF	ON	OFF
7525	Ext. comm. error	Fail class	Alarm	Trip MB	Warning

5. Data tables

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

Address	Content	Type	
		ML-2	AGC mains
0	U_{L1-L2}	Generator voltage. Measured in [V]	Mains voltage. Measured in [V]
1	U_{L2-L3}	Generator voltage. Measured in [V]	Mains voltage. Measured in [V]
2	U_{L3-L1}	Generator voltage. Measured in [V]	Mains voltage. Measured in [V]
3	U_{L1-N}	Generator voltage. Measured in [V]	Mains voltage. Measured in [V]
4	U_{L2-N}	Generator voltage. Measured in [V]	Mains voltage. Measured in [V]
5	U_{L3-N}	Generator voltage. Measured in [V]	Mains voltage. Measured in [V]
6	f_{L1}	Generator freq. Measured in [Hz/100]	Mains freq. Measured in [Hz/100]
7	I_{L1}	Generator current. Measured in [A]	Mains current. Measured in [A]
8	I_{L2}	Generator current. Measured in [A]	Mains current. Measured in [A]
9	I_{L3}	Generator current. Measured in [A]	Mains current. Measured in [A]
10	P_{GEN}	Generator active power. Measured in [kW]. Negative value means reverse power	
11	Q_{GEN}	Generator reactive power. Measured in [kVAr]. Positive value means generated inductive reactive power	
12	S_{GEN}	Generator apparent power. Measured in [kVA]	
13	Cos-phi	-99/+100 generator cosinus-phi. Measured in cos-phi:100. Negative value means capacitive cos-phi	
14 [HI] 15 [LO]	R_{GEN}	Reactive energy counter. Measured in [kVArh]. Max. 300000 MVarh	
16 [HI] 17 [LO]	E_{GEN}	Energy counter. Measured in [kWh]. Max. 300000 MWh	
18	$U_{BBL1-L2}$	Busbar voltage. Measured in [V]	
19	$U_{BBL2-L3}$	Busbar voltage. Measured in [V]	
20	$U_{BBL3-L1}$	Busbar voltage. Measured in [V]	
21	U_{BBL1-N}	Busbar voltage. Measured in [V]	
22	U_{BBL2-N}	Busbar voltage. Measured in [V]	
23	U_{BBL3-N}	Busbar voltage. Measured in [V]	
24	F_{BB}	Busbar frequency L1. Measured in [Hz/100]	
25	$PHI_{BBL1-L2}$	+/-180 deg. busbar phase angle. Measured in [deg.]	
26	$PHI_{BBL1-DGL1}$	+/-180 deg. busbar/generator phase angle. Measured in [deg.]	
27	Alarms	Number of alarms	
28	Alarms	Number of unack. alarms	
29	Start attempts	Start attempts	

Address	Content	Type			
30 [HI] 31 [LO]	Abs. run. hours	Hour			
32	GB _{oper}	GB operations counter			
33	MB _{oper}	MB operations counter			
34	U _{SUPPLY}	Supply voltage. Measured in [V/10]			
35	U _{SUPPLY M4}	M4 supply voltage. Measured in [V/10]			
36	RPM	RPM			
37		Multi input 102, unscaled			
38		Multi input 105, unscaled			
39		Multi input 108, unscaled			
40		Control register table address 0			
41		Control register table address 1			
42		Control register table address 2			
43		Control register table address 3			
44		Control register table address 4			
45		Control register table address 5			
46		Control register table address 6			
47		Control register table address 7			
48	Protection alarms	Bit 0	1000	G -P> 1	
		Bit 1	1010	G -P> 2	
		Bit 2		Reserved	
		Bit 3	1030	G I> 1	
		Bit 4	1040	G I> 2	
		Bit 5	1050	G I> 3	
		Bit 6	1060	G I> 4	
		Bit 7		Reserved	
		Bit 8		Reserved	
		Bit 9	1130	G I>> 1	
		Bit 10	1140	G I>> 2	
		Bit 11	1150	G U> 1	M U> 1
		Bit 12	1160	G U> 2	M U> 2
		Bit 13	1170	G U< 1	M U< 1
		Bit 14	1180	G U< 2	M U< 2
		Bit 15	1190	G U< 3	M U< 3
49	Protection alarms	Bit 0	1210	G f> 1	M f> 1
		Bit 1	1220	G f> 2	M f> 2
		Bit 2	1230	G f> 3	M f> 3
		Bit 3	1240	G f< 1	M f< 1
		Bit 4	1250	G f< 2	M f< 2
		Bit 5	1260	G f< 3	M f< 3
		Bit 6	1270	BB U> 1	
		Bit 7	1280	BB U> 2	
		Bit 8	1290	BB U> 3	
		Bit 9	1300	BB U< 1	
		Bit 10	1310	BB U< 2	

Address	Content	Type		
		Bit 11	1320	BB U< 3
		Bit 12	1330	BB U< 4
		Bit 13	1350	BB f> 1
		Bit 14	1360	BB f> 2
		Bit 15	1370	BB f> 3
50	Protection alarms	Bit 0	1380	BB f< 1
		Bit 1	1390	BB f< 2
		Bit 2	1400	BB f< 3
		Bit 3	1410	BB f< 4
		Bit 4	1420	df/dt (ROCOF)
		Bit 5	1430	Vector jump
		Bit 6	1440	BB Pos seq volt
		Bit 7	1450	G P> 1
		Bit 8	1460	G P> 2
		Bit 9	1470	G P> 3
		Bit 10	1480	G P> 4
		Bit 11	1490	G P> 5
		Bit 12	1500	Unbalance current
		Bit 13	1510	Unbalance voltage
		Bit 14	1520	G -Q>
		Bit 15	1530	G Q>
51	Synchronisation alarms	Bit 0	2120	Sync. window
		Bit 1	2130	GB sync. failure
		Bit 2	2140	MB sync. failure
		Bit 3	2150	Phase seq error
		Bit 4	2160	GB/TB open failure
		Bit 5	2170	GB/TB close failure
		Bit 6	2180	GB/TB pos failure
		Bit 7	2200	MB open failure
		Bit 8	2210	MB close failure
		Bit 9	2220	MB pos failure
		Bit 10	2270	Close before excitation failure
		Bit 11		NOT USED
		Bit 12		NOT USED
		Bit 13		NOT USED
		Bit 14		NOT USED
		Bit 15		NOT USED
52	Digital inputs	Bit 0	3130	Dig. input 43
		Bit 1	3140	Dig. input 44
		Bit 2	3150	Dig. input 45
		Bit 3	3160	Dig. input 46
		Bit 4	3170	Dig. input 47
		Bit 5	3180	Dig. input 48
		Bit 6	3190	Dig. input 49
		Bit 7	3200	Dig. input 50

Address	Content	Type		
		Bit 8	3210	Dig. input 51
		Bit 9	3220	Dig. input 52
		Bit 10	3230	Dig. input 53
		Bit 11	3240	Dig. input 54
		Bit 12	3250	Dig. input 55
		Bit 13		NOT USED
		Bit 14		NOT USED
		Bit 15		NOT USED
53	Digital inputs	Bit 0		Reserved
		Bit 1		Reserved
		Bit 2		Reserved
		Bit 3		Reserved
		Bit 4		Reserved
		Bit 5		Reserved
		Bit 6		Reserved
		Bit 7	3330	Dig. input 91
		Bit 8	3340	Dig. input 92
		Bit 9	3350	Dig. input 93
		Bit 10	3360	Dig. input 94
		Bit 11	3370	Dig. input 95
		Bit 12	3380	Dig. input 96
		Bit 13	3390	Dig. input 97
		Bit 14		NOT USED
		Bit 15		NOT USED
54	Digital inputs	Bit 0	3400	Dig. multi input 102
		Bit 1	3410	Dig. multi input 105
		Bit 2	3420	Dig. multi input 108
		Bit 3	3401	W. failure, dig. multi input 102
		Bit 4	3411	W. failure, dig. multi input 105
		Bit 5	3421	W. failure, dig. multi input 108
		Bit 6	3430	Dig. input 112
		Bit 7	3440	Dig. input 113
		Bit 8	3450	Dig. input 114
		Bit 9	3430	Dig. input 115
		Bit 10	3440	Dig. input 116
		Bit 11	3450	Dig. input 117
		Bit 12	3460	Dig. input 118, emergency stop
		Bit 13	3470	NOT USED
		Bit 14	3480	NOT USED
		Bit 15	3490	NOT USED
55	Analogue inputs	Bit 0	3500	Dig. input 127
		Bit 1	3510	Dig. input 128
		Bit 2	3520	Dig. input 129
		Bit 3	3530	Dig. input 130
		Bit 4	3540	Dig. input 131

Address	Content	Type		
		Bit 5	3550	Dig. input 132
		Bit 6	3560	Dig. input 133
		Bit 7		NOT USED
		Bit 8		NOT USED
		Bit 9		NOT USED
		Bit 10		NOT USED
		Bit 11		NOT USED
		Bit 12		NOT USED
		Bit 13		NOT USED
		Bit 14		NOT USED
		Bit 15		NOT USED
56	Analogue inputs	Bit 0	4000	4-20mA No91.1
		Bit 1	4010	4-20mA No91.2
		Bit 2	4020	W. fail ana 91
		Bit 3	4030	4-20mA No93.1
		Bit 4	4040	4-20mA No93.2
		Bit 5	4050	W. fail ana 93
		Bit 6	4060	4-20mA No95.1
		Bit 7	4070	4-20mA No95.2
		Bit 8	4080	W. fail ana 95
		Bit 9	4090	4-20mA No97.1
		Bit 10	4100	4-20mA No97.2
		Bit 11	4110	W. fail ana 97
		Bit 12		NOT USED
		Bit 13		NOT USED
		Bit 14		NOT USED
		Bit 15		NOT USED
57		Bit 0		Multi input 102.1
		Bit 1		Multi input 102.2
		Bit 2	4240	W. failure, multi input 102
		Bit 3		Multi input 105.1
		Bit 4		Multi input 105.2
		Bit 5	4370	W. failure, multi input 105
		Bit 6		Multi input 108.1
		Bit 7		Multi input 108.2
		Bit 8	4500	W. failure, multi input 108
		Bit 9	4510	Overspeed 1
		Bit 10	4520	Overspeed 2
		Bit 11	4530	Crank failure
		Bit 12	4540	Run feedb. fail
		Bit 13	4550	MPU wire failure
		Bit 14	4550	Generator Hz/V failure
		Bit 15	4570	Start failure
58		Bit 0	5000	Relay 5
		Bit 1	5010	MB OFF / relay 8

Address	Content	Type		
		Bit 2	5020	MB ON / relay 11
		Bit 3	5030	GB/TB OFF / relay 14
		Bit 4	5040	GB/TB ON / relay 17
		Bit 5	5050	Relay 20
		Bit 6	5060	Relay 21
		Bit 7	5070	Relay 29
		Bit 8	5080	Relay 31
		Bit 9	5900	Relay 33
		Bit 10	5100	Relay 35
		Bit 11	5110	Relay 57
		Bit 12	5120	Relay 59
		Bit 13	5130	Relay 61
		Bit 14	5140	Relay 63
		Bit 15		NOT USED
59		Bit 0		Block
		Bit 1		Manual
		Bit 2		Semi
		Bit 3		Auto
		Bit 4		Test
		Bit 5		Island
		Bit 6		AMF
		Bit 7		Peak shaving
		Bit 8		Fixed power
		Bit 9		Mains power export
		Bit 10		Load take over
		Bit 11		NOT USED
		Bit 12		NOT USED
		Bit 13		NOT USED
		Bit 14		NOT USED
		Bit 15		AMF active
60	Communication	Bit 0	7570	EIC comm. error
		Bit 1	7580	EIC warning
		Bit 2	7590	EIC shutdown
		Bit 3	7600	EIC overspeed
		Bit 4	7610	EIC coolant temp. 1
		Bit 5	7620	EIC coolant temp. 2
		Bit 6	7630	EIC oil pressure 1
		Bit 7	7640	EIC oil pressure 2
		Bit 8		NOT USED
		Bit 9		NOT USED
		Bit 10		NOT USED
		Bit 11		NOT USED
		Bit 12		NOT USED
		Bit 13		NOT USED
		Bit 14		NOT USED

Address	Content	Type		
		Bit 15		NOT USED

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

Address	Content	Description	Available in
0	Power regulator set point	0...100% of nominal power Activated in menu 7501	AGC
1	PF regulator set point	60...100 stated as PF value/100. The value 100 means PF = 1 Activated in menu 7504	AGC
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	AGC
3	Frequency regulator set point	+/-100% corresponding to +/-10.0% of nominal frequency. Activated in menu 7502	AGC
4	Voltage regulator set point	+/-100% corresponding to +/-10.0% of nominal voltage. Activated in menu 7503	AGC
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 Bit 1 Start Bit 2 GB/CB/TB ON Bit 3 GB/CB/TB OFF Bit 4 Stop Bit 5 Reset analogue regulation outputs Bit 6 Bit 7 Alarm inhibit 1 Bit 8 Alarm inhibit 2 Bit 9 Alarm inhibit 3 Bit 10 Alarm ack. This bit is automatically reset. Bit 11 Nominal setting 1 Bit 12 Nominal setting 2 Bit 13 Nominal setting 3 Bit 14 Nominal setting 4 Bit 15	AGC
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 Bit 1 Island Bit 2 Automatic mains failure (AMF) Bit 3 Peak shaving Bit 4 Fixed power Bit 5 Mains power export (MPE) Bit 6 Load take over (LTO) Bit 7 Bit 8 Bit 9 MB ON Bit 10 MB OFF Bit 11 Auto start/stop Bit 12 Manual mode Bit 13 Semi-auto mode	AGC

Address	Content	Description	Available in
		Bit 14 Auto mode Bit 15 Test mode	
7		Bit 0 This bit must be 1 when writing the command word. If the bit is 0, the control command is ignored Bit 1 External frequency control Bit 2 External voltage control Bit 3 External power control Bit 4 External reactive power control Bit 5 External power factor control Bit 6 Bit 7 Bit 8 Bit 9 Bit 10 Bit 11 Bit 12 Bit 13 Bit 14 Battery test Bit 15 Event printer	AGC
8-13		Not used	AGC

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