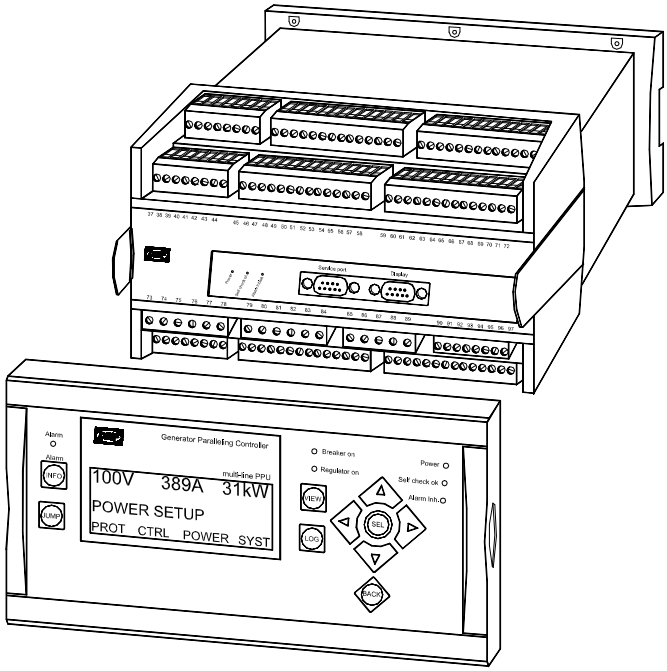
DEIF A/S

Description of options

Option H3
Serial communication – Profibus DP
Multi-line 2 – version 2

4189340279I
SW 2.42.X



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This manual is valid for standard multi-line 2 GPU/GPC/PPU units with firmware version 2.42.1 or later.

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

This document describes the functionality of Profibus DP communication for multi-line PPU/GPC/GPU.

H3 option

Function	ANSI no.
Profibus DP slave communication	-

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 ensured by the international standards EN 50170 and EN 50254.

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

Terminal description

Profibus (option H3)

Term.	Description	Remark
29	DATA+ (B)	9-pin sub-D pin 3
30	GND	9-pin sub-D pin 5
31	DATA – (A)	9-pin sub-D pin 8
32	DATA+ (B)	
33	GND	
34	DATA – (A)	
35	Not used	
36	Not used	

The serial communication line should be terminated between DATA + and DATA - with a resistor equal to the cable impedance.

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

For wiring diagrams, please refer to the installation instructions.

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 4061.

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

The setup of the parameters is done from the display or the PC utility software (USW).

For further information about menu structure, see the Designer's Reference Handbook.

Profibus setup

The setup of parameters is done via the display or the PC utility software (USW).

4050 Communication control enable/disable control

No.	Setting		Min. setting	Max. setting	Factory setting
4051	Comm. control	Power	OFF	ON	OFF
4052	Comm. control	Frequency	OFF	ON	OFF
4053	Comm. control	Voltage	OFF	ON	OFF
4054	Comm. control	VAr	OFF	ON	OFF
4055	Comm. control	PF	OFF	ON	OFF

4060 Communication ID address

No.	Setting		Min. setting	Max. setting	Factory setting
4061	External comm.	ID	1	247	3

The Baud rate is automatically changed with Profibus communication.

4090 External communication error

No.	Setting		Min. setting	Max. setting	Factory setting
4091	Ext comm. error	Delay	1.0 s	100.0 s	10.0 s
4092	Ext comm. error	Relay output A	R0 (none)	Option dependent	R0 (none)
4093	Ext comm. error	Relay output B	R0 (none)		R0 (none)
4094	Ext comm. error	Enable	OFF	ON	OFF

5. Data tables

Measurement table (input data)

Address	Content	Type
0		Application version
1	U_{L1-L2}	Generator voltage. Measured in [V]
2	U_{L2-L3}	Generator voltage. Measured in [V]
3	U_{L3-L1}	Generator voltage. Measured in [V]
4	U_{L1-N}	Generator voltage. Measured in [V]
5	U_{L2-N}	Generator voltage. Measured in [V]
6	U_{L3-N}	Generator voltage. Measured in [V]
7	F_{GEN}	Generator frequency. Measured in [Hz/100]
8	I_{L1}	Generator current. Measured in [A]
9	I_{L2}	Generator current. Measured in [A]
10	I_{L3}	Generator current. Measured in [A]
11	Cos-phi	-99...0...100 Generator cosinus-phi. Measured in cos-phi:100 Negative value means capacitive cos-phi
12	P_{GEN}	Generator active power. Measured in [kW]. Negative value means reverse power
13	Q_{GEN}	Generator reactive power. Measured in [kvar]. Positive value means generated inductive reactive power
14	$U_{BBL1-L2}$	Busbar. Measured in [V]
15	F_{BB}	Busbar frequency L1. Measured in [Hz/100]
16 [HI] 17 [LO]	R_{GEN} Export	Reactive energy counter, exported reactive power. Measured in [kvarh]. Max. 300000 Mvarh
18 [HI] 19 [LO]	E_{GEN} Export	Energy counter, exported power. Measured in [kWh]. Max. 300000MWh
20	Alarms	Bit 0 1010. Reverse power Bit 1 1020. Overcurrent step 1 Bit 2 1030. Overcurrent step 2 Bit 3 1060. Overcurrent inverse Bit 4 1070. Fast overcurrent Bit 5 1080. High overcurrent Bit 6 Reserved Bit 7 1100. U-DG High step 1 Bit 8 1110. U-DG High step 2 Bit 9 1120. U-DG Low step 1 Bit 10 1130. U-DG Low step 2 Bit 11 1140. f-DG High step 1 Bit 12 1150. f-DG High step 2 Bit 13 1160. f-DG Low step 1 Bit 14 1170. f-DG Low step 2 Bit 15 1180. U-BB High step 1

Address	Content	Type	
21	Alarms	Bit 0	1190. U-BB High step 2
		Bit 1	1200. U-BB Low step 1
		Bit 2	1210. U-BB Low step 2
		Bit 3	1220. f-BB High step 1
		Bit 4	1230. f-BB High step 2
		Bit 5	1240. f-BB Low step 1
		Bit 6	1250. f-BB Low step 2
		Bit 7	1260. Overload step 1
		Bit 8	1270. Overload step 2
		Bit 9	1280. Unbalance current
		Bit 10	1290. Unbalance voltage
		Bit 11	1300. Q import
		Bit 12	1310. Q export
		Bit 13	1320. Gen. neg. sequence current
		Bit 14	1330. Gen. neg. sequence voltage
		Bit 15	1390. Overload step 3
22	Alarms	Bit 0	1350. df/dt (ROCOF)
		Bit 1	1360. Vector jump
		Bit 2	3440. 4-20 mA input no. 1.1
		Bit 3	3460. 4-20 mA input no. 2.1
		Bit 4	3480. 4-20 mA input no. 3.1
		Bit 5	3500. 4-20 mA input no. 4.1
		Bit 6	3520. 4-20 mA input no. 5.1
		Bit 7	3540. 4-20 mA input no. 6.1
		Bit 8	3560. 4-20 mA input no. 7.1
		Bit 9	3580. 4-20 mA input no. 8.1
		Bit 10	3600. Pt 100 no. 1.1
		Bit 11	3620. Pt 100 no. 2.1
		Bit 12	3640. Overspeed (Tacho) 1
		Bit 13	3120. Dig. input term. 23
		Bit 14	3130. Dig. input term. 24
		Bit 15	3140. Dig. input term. 25
23	Alarms	Bit 0	3150. Dig. input term. 26
		Bit 1	3160. Dig. input term. 27
		Bit 2	3170. Dig. input term. 43
		Bit 3	3180. Dig. input term. 44
		Bit 4	3190. Dig. input term. 45
		Bit 5	3200. Dig. input term. 46
		Bit 6	3210. Dig. input term. 47
		Bit 7	3220. Dig. input term. 48
		Bit 8	3230. Dig. input term. 49
		Bit 9	3240. Dig. input term. 50
		Bit 10	3250. Dig. input term. 51
		Bit 11	3260. Dig. input term. 52
		Bit 12	3270. Dig. input term. 53
		Bit 13	3280. Dig. input term. 110
		Bit 14	3290. Dig. input term. 111
		Bit 15	3300. Dig. input term. 112

Address	Content	Type	
24	Alarms	Bit 0	3310. Dig. input term. 113
		Bit 1	3320. Dig. input term. 114
		Bit 2	3330. Dig. input term. 115
		Bit 3	3340. Dig. input term. 116
		Bit 4	3350. Dig. input term. 117
		Bit 5	3360. Dig. input term. 118
		Bit 6	3370. Dig. input term. 127
		Bit 7	3380. Dig. input term. 128
		Bit 8	3390. Dig. input term. 129
		Bit 9	3400. Dig. input term. 130
		Bit 10	3410. Dig. input term. 131
		Bit 11	3420. Dig. input term. 132
		Bit 12	3430. Dig. input term. 133
		Bit 13	3660. Oil pressure (VDO sensor 1) 1
		Bit 14	3680. Water temperature (VDO sensor 2) 1
		Bit 15	3700. Fuel level (VDO sensor 3) 1
25	System alarms/ status	Bit 0	Sync. fail. alarm
		Bit 1	Generator breaker ON failure
		Bit 2	Generator breaker OFF failure
		Bit 3	Generator breaker position fail. alarm
		Bit 4	Phase sequence error alarm
		Bit 5	Governor regulator fail. alarm
		Bit 6	AVR regulator fail. alarm
		Bit 7	Battery voltage alarm
		Bit 8	Sync. timer runout
		Bit 9	Reserved
		Bit 10	Reserved
		Bit 11	Start attempts alarm
26	Alarm relay status	Bit 0	Relay 0
		Bit 1	Relay 1
		Bit 2	Relay 2
		Bit 3	Relay 3
		Bit 4	Relay 4
		Bit 5	Relay 5
		Bit 6	Relay 6
		Bit 7	Relay 7
		Bit 8	Relay 8
		Bit 9	Relay 9 (Stop engine)
		Bit 10	Relay 10
		Bit 11	Relay 11
		Bit 12	Relay 12
		Bit 13	Relay 13
		Bit 14	Relay 14
		Bit 15	Relay 15

Address	Content	Type	
27	Status	Bit 0	Mode 1
		Bit 1	Mode 2
		Bit 2	Mode 3
		Bit 3	Mode 4
		Bit 4	Mode 5
		Bit 5	Mode 6
		Bit 6	De-load
		Bit 7	Start sync./reg.
		Bit 8	Alarm inhibit
		Bit 9	Breaker position ON
		Bit 10	Synchronising
		Bit 11	Relay 16
28		Bit 0	3450. 4-20 mA input no. 1.2
		Bit 1	3470. 4-20 mA input no. 2.2
		Bit 2	3490. 4-20 mA input no. 3.2
		Bit 3	3510. 4-20 mA input no. 4.2
		Bit 4	3530. 4-20 mA input no. 5.2
		Bit 5	3550. 4-20 mA input no. 6.2
		Bit 6	3570. 4-20 mA input no. 7.2
		Bit 7	3590. 4-20 mA input no. 8.2
		Bit 8	3610. Pt 100 no. 1.2
		Bit 9	3630. Pt 100 no. 2.2
		Bit 10	3650. Overspeed (Tacho) 2
		Bit 11	3670. Oil pressure (VDO sensor 1) 2
		Bit 12	3690. Water temperature (VDO sensor 2) 2
		Bit 13	3710. Fuel level (VDO sensor 3) 2
		Bit 14	1370. Zero sequence current
		Bit 15	1380. Zero sequence voltage
29	$U_{DG\text{-}max}$	Generator max. voltage. Measured in [V]	
30	$U_{DG\text{-}min}$	Generator min. voltage. Measured in [V]	
31	$U_{BBL2\text{-}L3}$	Busbar voltage. Measured in [V]	
32	$U_{BBL3\text{-}L1}$	Busbar voltage. Measured in [V]	
33	$U_{BB\text{-}max}$	Busbar max. voltage. Measured in [V]	
34	$U_{BB\text{-}min}$	Busbar min. voltage. Measured in [V]	
35	$U_{BBL1\text{-}N}$	Busbar voltage. Measured in [V]	
36	$U_{BBL2\text{-}N}$	Busbar voltage. Measured in [V]	
37	$U_{BBL3\text{-}N}$	Busbar voltage. Measured in [V]	
38	Running time	Hour	
39	RPM	RPM	
40	S_{GEN}	Generator apparent power. Measured in [kVA]	
41	VDO 1	Oil pressure in [bar]/10	
42	VDO 2	Water temp. in [^{o}C]	
43	VDO 3	Fuel level in [%]	
44	$PHI_{BBL1\text{-}L2}$	0...359 Busbar phase angle. Measured in [deg.]	
45	$PHI_{BBL1\text{-}DGL1}$	0...359 Busbar/generator phase angle. Measured in [deg.]	
46	CB_{oper}	Circuit breaker operations counter	
47	U_{SUPPLY}	Supply voltage. Measured in [V/10]	
48	PT100 (1)	-40 – 250 temperature in deg. (engine interface)	
49	PT100 (2)	-40 – 250 temperature in deg. (engine interface)	
50		Control register table address 0	

Address	Content	Type
51		Control register table address 1
52		Control register table address 3
53		Control register table address 4
54		Control register table address 5
55		Analog input no. 1 (scaled)
56		Analog input no. 2 (scaled)
57		Analog input no. 3 (scaled)
58		Analog input no. 4 (scaled)
59		Analog input no. 5 (scaled)
60		Analog input no. 6 (scaled)

Control register table (Output data)

Address	Content	Description
0	Power regulator set point	0...100% of nominal power Activated in menu 4051
1	PF regulator set point	60...100 stated as PF value/100. The value 100 means PF = 1 Activated in menu 4055
2	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 Mode 1 Bit 2 Mode 2 Bit 3 Mode 3 Bit 4 Mode 4 Bit 5 Mode 5 Bit 6 Mode 6 Bit 7 De-load Bit 8 Start sync./reg. Bit 9 Alarm inhibit Bit 10 Alarm ack. This bit is automatically reset in multi-line 2 Bit 11 Second set point (protection functions)
3	Frequency regulator set point	-500...500%/10. Based on nominal frequency Activated in menu 4042
4	Voltage regulator set point	-100...100%/10 of nominal voltage Activated in menu 4043
5	Reactive power regulator set point	-250...250% of nominal power. A negative value means capacitive reactive power, and a positive value means inductive reactive power. Activated in menu 4044

If terminal 26 "Control via external communication" is activated, the regulators are controlled via the Modbus. The digital inputs "Alarm ack" and "Alarm inhibit" are always handled even if terminal 26 = ON.

In menu 4050 it is selected, if a set point is to be controlled by analogue input or by the control registers. (Mode 3 and/or mode 4 must be on). It is possible to write to the control registers also when terminal 26 = OFF. The contents of the control registers are not lost in case of supply failure, so frequent updates are not necessary.