

QUICK START GUIDE



PPM-3 Protection and Power Management

- What's in the delivery?
- Getting started
- The first steps
- Using the PPM-3
- Drawings



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1. General information

1.1 Warnings, legal information and safety

1.1.1 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

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

Notes



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

1.1.2 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.



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.

1.1.3 Safety issues

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.



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

1.1.4 Electrostatic discharge awareness

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

1.1.5 Factory settings

The Multi-line 2 unit is delivered from factory with certain factory settings. These are based on average values and are not necessarily the correct settings for matching the engine/generator set in question. Precautions must be taken to check the settings before running the engine/generator set.

1.2 About the quick start guide

1.2.1 General purpose

This Quick Start Guide mainly includes general product information, mounting instructions and wiring descriptions.

The general purpose of this document is to help the user with the first steps of installing and using the Multiline 2 system.



Please make sure that you also read the Installation Instructions before starting to work with the Multi-line 2 unit and the genset to be controlled. Failure to do this could result in human injury or damage to the equipment.

1.2.2 Intended users

This Quick Start Guide is mainly intended for the panel builder in charge. On the basis of this document, the panel builder designer will give the electrician the information he needs in order to get started with the installation. For detailed electrical drawings, please see the Installation Instructions.

1.2.3 Contents and overall structure

This document is divided into chapters, and in order to make the structure simple and easy to use, each chapter will begin from the top of a new page.

2. What's in the delivery?

2.1 Standard and optional

2.1.1 Standard delivery

The main unit



Standard display, DU-2



Display cable, 3 m



2.1.2 Optional delivery

PC cable for utility software (option J7)

Two CANbus resistors, 120 ohm





Additional standard display, DU-2 (option X2)





Display unit, DU-2 Layout is option-dependent DC/DC converter and 2 x CANbus cable 3 m

Additional operator panel, AOP-1 with 0.5 m cable (option X3)



AOP-1



0.5 m cable

Additional operator panel, AOP-2 with DC/DC converter and 2x3 m CANbus cable (option X4)



AOP-2

DC/DC converter and 2 x CANbus cable 3 m

3. Getting started

3.1 Connecting the devices

3.1.1 Connecting the display with the main unit

Connect the SUB-D display cable to the main unit and the display unit as shown in the picture below.





No use of tools or brute force when tightening finger-screws on display cable.

3.1.2 Connecting the power supply to the main unit



- 1. Terminal 1: +24V DC
- 2. Terminal 2: 0V DC
- 3. Terminal 98: +24V DC
- 4. Terminal 99: 0V DC

3.1.3 Connecting the AOP-1 (optional)



3.1.4 Connecting the AOP-2 (optional)

The CAN cable for the CANbus communication between the display unit of main unit no. 1 and the AOP-2 has to be connected to the CAN port (CAN 2) of the display unit (DU-2) and the CAN port (CAN 1) of the AOP-2 as shown in the below drawing.



The AOP-2 can be placed up to 200 m from the main display. The AOP-2 requires a separate power supply unit, while the display receives the power supply through the display cable from the main unit.



For further information about the installation of multiple displays and AOP-2s, please refer to the document "Description of option X".

3.1.5 Terminal strip overview: DG (diesel generator); slots 1, 2, 5 and 6 Connecting the most important inputs and outputs to a **DG (diesel generator) unit Terminal strip overviews**

Slots #1, #2, #5 and #6





3.1.6 Terminal strip overview: DG (diesel generator); slots 3, 4, 7 and 8

Connecting the most important inputs and outputs to a DG (diesel generator) unit **Terminal strip overviews** Slots #3, #4, #7 and #8



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3.1.7 Terminal strip overview: EDG (emergency generator); slots 1, 2, 5 and 6

Connecting the most important inputs and outputs to an EDG (emergency generator) unit **Terminal strip overviews**

Slots #1, #2, #5 and #6





3.1.8 Terminal strip overview: EDG (emergency generator); slots 3, 4, 7 and 8

Connecting the most important inputs and outputs to an EDG (emergency generator) unit **Terminal strip overviews**

Slots #3, #4, #7 and #8



3.1.9 Terminal strip overview: SG (shaft generator); slots 1, 2, 5 and 6

Connecting the most important inputs and outputs to a SG (shaft generator) unit **Terminal strip overviews** Slots #1, #2, #5 and #6





3.1.10 Terminal strip overview: SG (shaft generator); slots 3, 4, 7 and 8

Connecting the most important inputs and outputs to a SG (shaft generator) unit **Terminal strip overviews** Slots #3, #4, #7 and #8

72 133 Relay 71 Configurable 71 Options: 132 70 131 Configurable Relay 69 - HBB:External VO Options 69 130 communication M13.8:7 Binery inputs M14.8:4 releyoutputs M15.8:4 x4-20 mA inputs 68 129 Relay 67 Configurable 67 128 66 127 Configurable Relay 65 65 Slot #4 Slot #8 126 64 **B**3 Slot #3 Slot #7 CANIL Trip NEL 2/Configurable Relay 63 B2 63 CANGND CANbus CANH B1 62 Trip NEL 1/Configurable Relay 61 A3 CANL 61 CANGND CANbus A2 60 A1 CAN H HC 2 ac kn/Configurable Relay 59 59 124 INT Configurable 123 58 HC 1 ackn./Configurable Relay 57 122 57 Configurable 121 Common forterm 43-55 56 Configurable 120 m inhibit 2/Configurable 55 119 Configurable TONT m inhibit 1/Configurable 54 118 Emergencystop(+) Configurable 53 1 1/1 117 Configurable CBshortcicuit/Configurable 52 116 Running feed b./Configurable I AVE I HC 2 fixed load feed b/Config. 51 _ ¥ #3{ | | ¥ #3{ | | ¥ #3{ | | | Configurable 115 HC 1 fixed load feed b./Config. 50 = 114 Configurable HC 2 request/Configurable 49 113 Configurable IC 1 request/Configurable 48 112 Configurable I XX I I 🛛 🕅 I Configurable 47 Common forterm 112-117 111 Configurable 46 110 ┇┓╲╡ ┇ ┇ 45 Configurable 109 B Multi-input 108 uP Configurable 108 ×. H 44 I AF 107 Configurable 43 C 106 8 Multi-input 105 Not used 42 105 I/F to main uP 41 104 Not used 103 B Multi-input 102 Not used 40 102 Notused 39 101 Not used 100 Not used 38 (·)/common for 118 99 Not used 37 (+) 8-36 VDC 98



3.1.11 Terminal strip overview: SCB (shore connection); slots 1, 2, 5 and 6

Connecting the most important inputs and outputs to a SCB (shore connection) unit **Terminal strip overviews**

Slots #1, #2, #5 and #6





3.1.12 Terminal strip overview: SCB (shore connection); slots 3, 4, 7 and 8

Connecting the most important inputs and outputs to a SCB (shore connection) unit **Terminal strip overviews**

Slots #3, #4, #7 and #8



3.1.13 Terminal strip overview: BTB (bus tie breaker); slots 1, 2, 5 and 6

Connecting the most important inputs and outputs to a BTB (bus tie breaker) unit **Terminal strip overviews**

Slots #1, #2, #5 and #6

3.1.14 Terminal strip overview: BTB (bus tie breaker); slots 3, 4, 7 and 8

Connecting the most important inputs and outputs to a BTB (bus tie breaker) unit **Terminal strip overviews**

Slots #3, #4, #7 and #8

4. The first steps

4.1 Adjusting essential parameters

4.1.1 Unit ID number

As default, all DG units are set to the ID number 1, all SG/SC are set to ID number 17, all BTB units are set to ID number 33, and the EDG unit is set to ID number 1. Each unit must have a different ID number to be able to communicate via the internal CANbus line. The following table shows the selection of ID number in connection to the main unit number:

DG number	ID number
DG 116	ID 116
EDG	ID 116
SG 12	ID 1720
SG 12	ID 1720
BTB 18	ID 3340

The next steps will explain how to change the ID number for the diesel generator unit number two.

Press JUMP

(1)
Use the \checkmark or \checkmark arrow keys to find setting 7530 "Int. Comm. ID" and pres \checkmark .
Use the \bigcirc or \bigcirc arrow keys to place the cursor under ID, and press \bigcirc .
Use the \checkmark or \checkmark arrow keys to set the password (factory setting is 2000). Press \checkmark .
Use the $\stackrel{\frown}{\longrightarrow}$ or $\stackrel{\bigtriangledown}{\bigtriangledown}$ arrow keys to set the value to 2.
Use the \bigcirc or \bigcirc arrow keys to place the cursor under SAVE and press \bigcirc .
The Internal CAN ID is now 02. Use the key to move out of the menu system

4.1.2 Basic AC values

This chapter guides you through the most essential parameters, which have to be adjusted before the PPM can be taken in operation.

The setpoints can either be adjusted from the display unit or by using the DEIF utility software. The following examples will show how to adjust the parameters from the display unit.

All settings are reached by placing the cursor under SETUP (in the main page) and pressing

Place the cursor under SYST and press

Place the cursor under the setting you require and press

Generator nominal settings

Channel number	Setpoint	Minimum setting	Factory setting	Maximum setting
6001	Nominal frequency	48.0 Hz	50.0 Hz	62.0 Hz
6002	Nominal power	10 kW	1000 kW	20000 kW
6003	Nominal current	0 A	1904 A	9000 A
6004	Nominal voltage	100 V	400 V	25000 V

To adjust the transformer settings, use the $\stackrel{\frown}{\longrightarrow}$ or $\stackrel{\frown}{\bigtriangledown}$ push-button to get to the transformer page:

VT and CT settings

Channel	Setpoint	Minimum set-	Factory setting	Maximum setting
number		ung		
6041	GEN Transformer U primary	100 V	400 V	25000 V
6042	GEN Transformer U secondary	100 V	400 V	690 V
6043	GEN Transformer I primary	5 A	2000 A	9000 A
6044	GEN Transformer I secondary	1 A	1 A	5 A
6051	BB settings U primary	100 V	400 V	25000 V
6052	BB settings U secondary	100 V	400 V	690 V

To adjust the power management settings, go back to the system setup menu and highlight the power management (PM) setup.

4.2 Installation of the utility software (USW)

4.2.1 Downloading the software

- 1. Go to www.deif.com
- 2. Select Documentation & Software
- 3. Select Software download
- 4. In the dropdown menu, select Multi-line 2 utility software v.3.x
- 5. Fill in your e-mail address and click "Submit"

You will now receive an e-mail containing a link. Click the link and follow the instructions.

The USW is now installed on your computer.

4.2.2 Installation of USB drivers

On Windows Vista machines, the USB drivers are installed automatically.

This is the procedure on Windows XP machines:

When you connect the DEIF product, Windows XP will launch two "Hardware Wizards". Two drivers are installed, so please let Windows execute both "Found new Hardware Wizard"s.

We recommend letting the Hardware Wizard install the software automatically by choosing the "Recommended" option. If the "Advanced" option is chosen, the needed files are available from the USW3 installation folder (default: C:\Program Files\DEIF\USW3\) in the "USB driver files/source PreInstaller" folder.

Please select "Continue Anyway" if a "Hardware Installation" warning (see screenshot below) appears during the installation.

Hardwar	e Installation
	The software you are installing for this hardware:
	has not passed Windows Logo testing to verify its compatibility with Windows XP. (Tell me why this testing is important.) Continuing your installation of this software may impair or destabilize the correct operation of your system either immediately or in the future. Microsoft strongly recommends that you stop this installation now and contact the hardware vendor for software that has passed Windows Logo testing.
	Continue Anyway STOP Installation

4.2.3 Getting connected with the PPM

Connect the service port to the USB on the computer (option J7 or option J3).

Click the Utility Software 3 icon on the desktop or in the Windows Start menu.

Desktop icon: Utility Software 3.lnk

Quick launch and Start menu icon:

The below window appears.

Open the application settings by clicking this icon.

Open "Windows device manager".

Check the COM port used for communication, and make sure the settings correspond to the application settings.

Click the "Connect" icon.

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You are now online with the PPM.

4.2.4 Read parameters from the device

After retrieving all the parameters, the device is ready to be configured.

4.2.5 Basic configuration of a device using the utility software

When the parameters have been uploaded, the options below will be available.

OEIF utility software											Click the "Gen"
Ele Connection Settings	Irending Earland	ieters Help									Olicit the Och
	3 H 2 1	40× 40+	P 0 = 10 10 = 1	1 9 3	00 99	-					tab.
OED 📰	• Prof Syn	a Reg Dan J	Cut Oan Mane	Comm P	m June Chi	timer US	w voo 102	V00 1	05 VDO	108	Gen
None Prot Syno Reg	Bin Ain Out	0en Mains Comm	Pm Jump Cmd timer USW	VD0 102 VD	0 105 VD0 108						
Drag a column header here to group b											
Category	Channel /	Text	Address Volue	Unit	Timer	AtuquC	OutputB	Enabled	High alarm	Level	
Gen	600	1 Nom. f 1	407	50 Hz	NA	N/A	N/A			Customer	
Gen	600	12 Nom. P 1	408	480 KW	NGA	N/A	NKA			Customer	
Gen	600	I3 Nom. I 1	409	867 A	NGA	N/A	NKA			Customer	
Gen	600	14 Nom. U 1	410	400 V	NGA	N/A	N/A			Customer	
Gen	600	IS Nom. rpm 1	411	1500 RPM	N/A	N/A	N/A			Customer	
Gen	600	6 Enable nom. set	412	0	N/A	N/A	NJA			Customer	
Gen	601	1 Nom. f 2	413	50 Hz	NA	N/A	N/A			Customer	
Gen	601	2 Nom. P 2	414	230 KW	N/A	N/A	NKA			Customer	
Gen	601	3 Nom. I 2	415	345 A	N/A	N/A	N/A			Customer	
Gen	601	4 Nom. U 2	416	480 V	NA	N/A	NIA			Customer	
Gen	601	5 Nom. rpm 2	417	1500 RPM	NA	N/A	NIA			Customer	
Gen	602	1 Nom. f 3	418	60 Hz	NGA	N/A	NIA			Customer	
Gen	602	2 Nom. P 3	419	230 KW	NGA	N/A	NVA			Customer	
Gen	603	13 Nom. I 3	420	345 A	NGA	N/A	NIA			Customer	
Cen	601	More II 3	421	490 17	DIG.	bito.	NIG			Outoner	

The parameters can be configured as follows:

Click a parameter and the dialogue box below will appear.

100	4	00 V -	25000
Password level :	Customer	2	
F Enetin F High Alern F Inverse proportio	nat		
Auto acknowled	pr.		/

Click this or use the bar to adjust the setpoint, then click "Write" and "OK".

The parameter setpoint has now been changed and downloaded to the device.

For further information, please refer to the General Guidelines for Commissioning.

4.3 Configuring the plant application

4.3.1 Configuring the plant application

To configure the application, you need to go to the application configuration:

Select PPM for product type and the plant setup, in this case: Multiple DG(s) + BTB + SHAFT meaning the plant consists of multiple diesel generators, a bus tie breaker and a shaft generator.

PPM Plant type Multiple DG(s) + BTB + SH	<u>-</u>
Plant type Multiple DG(s) + BTB + SH	
Multiple DG(s) + BTB + SH	and a second
1550 W. W. W. SN M.	IAFT 💌
Configuration selection —	
Configuration 1 👻	
Name:	
Bus Tie options	
🗖 Wrap bus bar	
CAN line options	
🔍 Use CAN A	
🔍 Use CAN B	
Use CAN A and B	
21/1	

The resulting plant overview looks like this:

Power parts configuration and a support in Configuration and a support in Configuration Configuration Configuration Configuration Configuration Configuration	Microlyment	
	GB1 GB2 SGB17	

The configuration is now placed on area3. If you need to add or change one of the areas (1 area per PPM unit), just click the area in question.

Use the ADD and DELETE button to add or delete generators/tie breakers. Remember to tick the box for the type in question.

Area control	Plant totals	
< 4	krea 3 of 3	>
Area configu	iration - Top —	
	None	~
ID	0	4.3
Middle —	194 194	
🔲 ВТВ	Pulse	v
ID	0	4.2
Bottom		
	Shaft gen	~
ID	17	*
< Add	Delete Ad	< bk

Upload/download of application

Once finished, the application has to be downloaded to the unit $\overset{\$}{2}$.

An existing application can be uploaded as well

4.4 Broadcast of the application

4.4.1 Broadcast of the application

To broadcast the uploaded application from one unit to the other units connected to the internal CANbus line,

press the weak push-button and select the parameter 9190. Select the application number, which should be transmitted to the other units:

DEIF	Protection	and Power Ma	nagement
		ти	lti-line PPM
G	0	0	0V
9190	Appl. Br	oadcast	
Appl	ication 1		
ENA	<u>APPL</u>		

After selecting the application, the broadcast function has to be activated:

DEIF	Protection	and Power Ma	anagement	
		m	ulti-line PPM	
G	0	0	0V	
9190 Appl. Broadcast				
Enable		ON		
RESE	Г		<u>SAVE</u>	

During transmit, the broadcasting unit indicates that the unit is sending the application by the following information message: "BROADCASTING APPL." while the receiving units are indicating the following information message: "RECEIVING APPL.".

4.5 Configuring the speed governor and AVR outputs

4.5.1 Settings

Dependent on the hardware configuration, relays or analogue outputs can be used for speed governor and AVR control.

The settings used for these are:

Set- ting	Text	Remarks	
2780	Reg. Output	Selection of Governor output type (2781) and AVR (2782). Possible settings are "relay" or "analogue".	
2600	Relay control (Governor)	Selection of which relays to use. Setting 2603 for increase relay, setting 2604 for decrease relay. Normally used: Relay 65 for increase and relay 67 for decrease. NOTE: These settings are only present if "relay" has been selected in setting 2781.	
2720	Relay control (AVR)	Selection of which relays to use. Setting 2723 for increase relay, setting 2724 for decrease relay. Normally used: Relay 69 for increase and relay 71 for decrease. NOTE: These settings are only present if "relay" has been selected in setting 2782.	
5981	Governor out- put (analogue)	Selection of which analogue output to use. NOTE: This setting is only available if "analogue" has been selected in setting 2781. Normally used is analogue output 66.	
5991	AVR output (analogue)	Selection of which analogue output to use. NOTE: This setting is only available if "analogue" has been selected in setting 2782. Normally used is analogue output 71.	

Analogue outputs require option E1, E2, EF2, or EF4.

Setup of a controller with analogue option and AVR option

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For further information, please refer to the General Guidelines for Commissioning.

Setup of a controller with relay and AVR option

For further information, please refer to the General Guidelines for Commissioning.

For further information, please check the following documents: PPM 3.0 Designer's Reference Handbook (doc. no. 4189340671) PPM 3.0 Installation Instructions (doc. no. 4189340741) PPM 3.0 Operator's Manual (doc. no. 4189340673)

5. Drawings

5.1 Diagrams

5.1.1 Minimum configuration, DG, EDG, SG, SC, BTB

Minimum configuration (DG unit)

Minimum configuration (EDG unit)

Minimum configuration (SG unit)

Minimum configuration (SC unit)

Minimum configuration (BTB unit)

