DEIF

-power in control

CE

APPLICATION NOTES



MULTI-LINE 2
Separate synchronisation relay

- Application description
- Functional description
- Wiring
- I/O lists
- Flowcharts

DEIF A/S · Frisenborgvej 33 · DK-7800 Skive
Tel.: +45 9614 9614 · Fax: +45 9614 9615
info@deif.com · www.deif.com

Document no.: 4189340622A
SW version:

1. General information

2. Contents

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 application notes

1.2.1 General purpose

This document includes application notes for DEIF's Multi-line 2 unit. It mainly includes examples of different applications suitable for the unit.

For functional descriptions, the procedure for parameter setup, parameter lists etc., please see the Designer's Reference Handbook.

The general purpose of the application notes is to offer the designer information about suitable applications for the Multi-line 2 unit.

Please make sure to read this document before starting to work with the Multi-line 2 unit and the gen-set to be controlled. Failure to do this could result in human injury or damage to the equipment.

1.2.2 Intended users

The Application Notes are mainly intended for the person responsible for designing Multi-line 2 systems. In most cases, this would be a panel builder designer. Naturally, other users might also find useful information in this document.

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. Contents

2.1 Delimitation

2.1.1 Scope of application notes

This application notes document covers the following products:

GPU-3	SW version 3.0x.x or later
PPM-3	SW version 3.0x.x or later
PPU-3	SW version 3.0x.x or later

2.2 Application description

2.2.1 System overview

This document describes the required HW, wiring and setup for a separate synchronisation relay in addition to the normal synchronisation relay, where this is required.

2.2.2 Required hardware

To support this application, the following hardware is required:

GPU-3 unit with the following options:

- Option G2 (synchronisation)

PPM-3 DG/SG/SC/BTB standard unit

PPU-3 standard unit

For a complete list of available options, please refer to www.deif.com.

2.3 Functional description

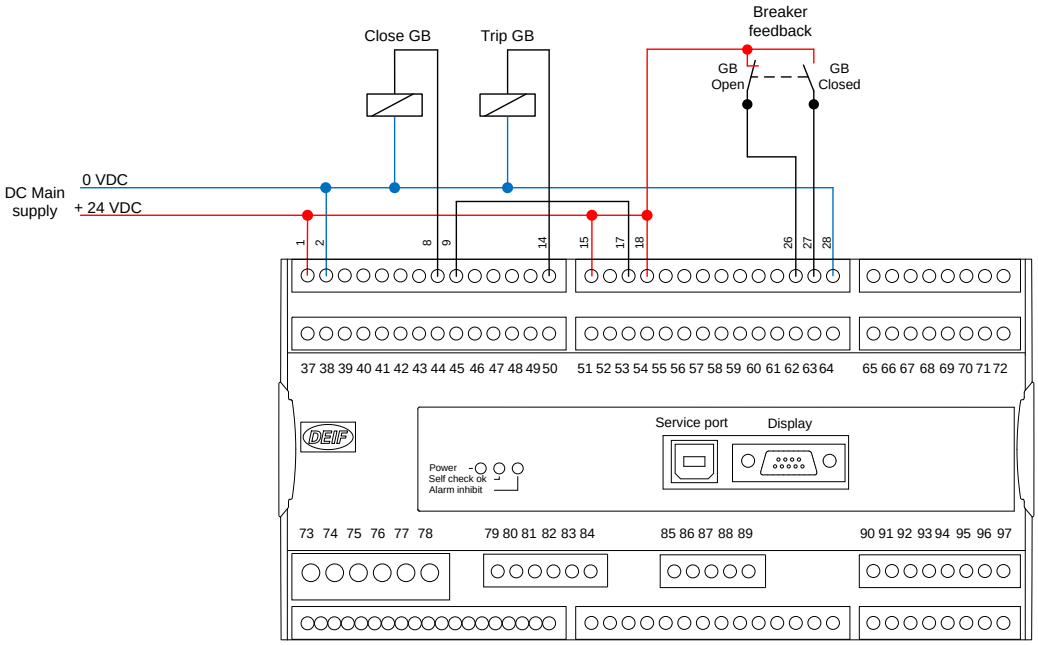
2.3.1 Separate synchronisation relay

The purpose of implementing a separate synchronisation relay is to ensure that parallel switching is impossible if:

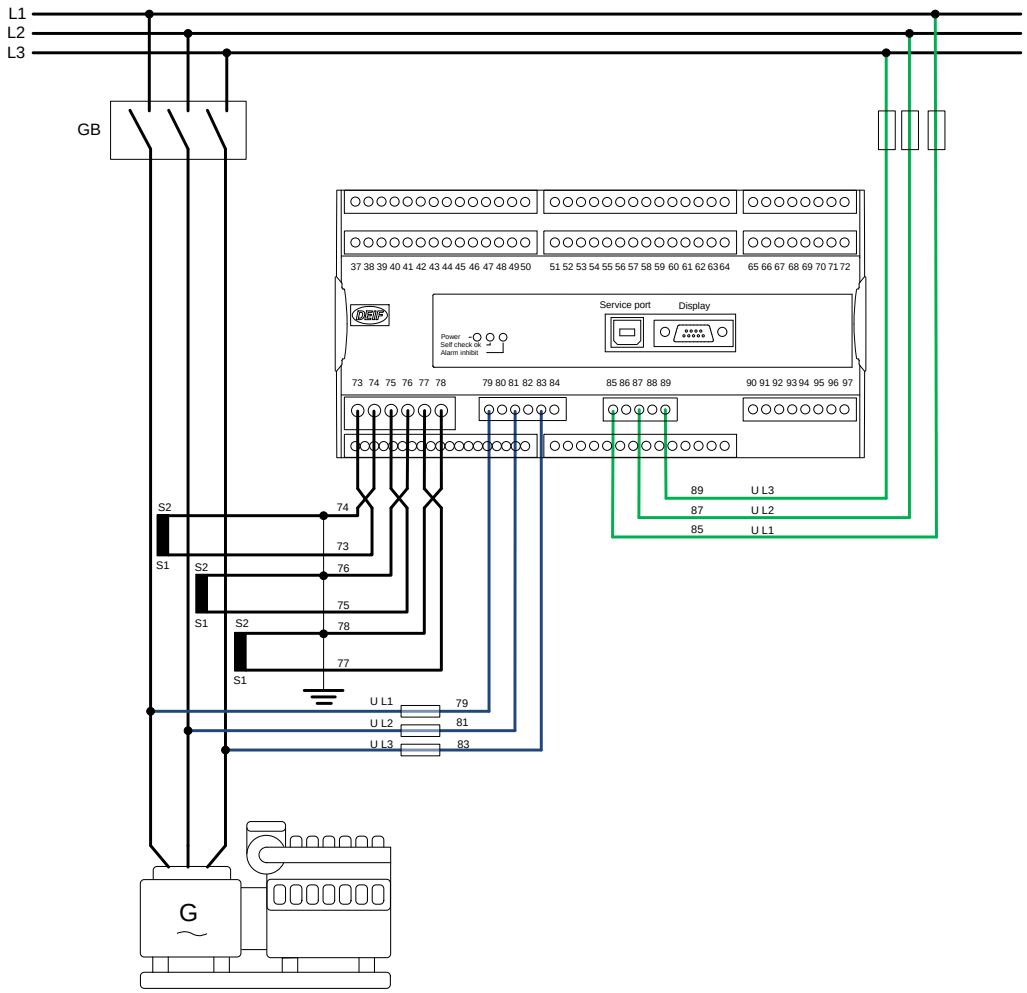
- the supply voltage fails
- measuring voltage fails
- any component fails

In addition to the normally used GB close relay (relay 17), an extra relay (separate synchronisation relay) will be activated when the synchronisation conditions are OK. The signal to the breaker is wired through the two relays in series, which means that the GB ON signal to the breaker will only be sent when both relays are closed.

2.4 DC wiring


Close GB
Trip GB
Breaker feedback
GB Open
GB Closed
DC Main supply
0 VDC
+ 24 VDC
1 2 8 9 14 15 17 18 26 27 28
37 38 39 40 41 42 43 44 45 46 47 48 49 50
51 52 53 54 55 56 57 58 59 60 61 62 63 64
65 66 67 68 69 70 71 72
Service port
Display
Power
Self check ok
Alarm inhibit
73 74 75 76 77 78
79 80 81 82 83 84
85 86 87 88 89
90 91 92 93 94 95 96 97

2.5 AC wiring


L1
L2
L3
GB
37 38 39 40 41 42 43 44 45 46 47 48 4950
51 52 53 54 55 56 57 58 59 60 61 62 6364
65 66 67 68 69 70 71 72
Service port
Display
Power
Self check ok
Alarm inhibit
73 74 75 76 77 78
79 80 81 82 83 84
85 86 87 88 89
90 91 92 93 94 95 96 97
89 U L3
87 U L2
85 U L1
S2
S1
74
73
76
75
78
77
U L1
U L2
U L3
79
81
83
G

2.6 I/O lists

Slot #1, power supply and digital I/Os (standard)

Term.	Function	Technical data	Description
1	+12/24V DC	8-36V DC	Power supply
2	0V DC		
3	NC	Status relay	Normally closed relay, processor/power supply status supervision
4	Com.	24 V/1 A	
5	NO	Relay 5	Alarm horn
6	Com.	250V AC/8 A	
7	NC		
8	NO	Relay 8	Separate sync. relay
9	Com.	250V AC/8 A	
10	NC		
11	NO	Relay 11	Configurable
12	Com.	250V AC/8 A	
13	NC		
14	NO	Relay 14	Open GB
15	Com.	250V AC/8 A	
16	NC		
17	NO	Relay 17	Close GB
18	Com.	250V AC/8 A	
19	NC		
20	Open collector 1	Transistor out (relay 20)	Configurable
21	Open collector 2	Transistor out (relay 21)	Configurable
22	Com.	Common	Common terminal for terminals 20 and 21
23	Digital input	Optocoupler	Configurable
24	Digital input	Optocoupler	Configurable
25	Digital input	Optocoupler	Configurable
26	Digital input	Optocoupler	GB open feedback
27	Digital input	Optocoupler	GB closed feedback
28	Com.	Common	Common for digital input 23 to 27

Slot #5, AC measuring (standard)

Term.	Function	Technical data	Description
73	I L1 s1	1/5A AC input	Generator current L1
74	I L1 s2		
75	I L2 s1	1/5A AC input	Generator current L2
76	I L2 s2		
77	I L3 s1	1/5A AC input	Generator current L3
78	I L3 s2		
79	U L1	Max. 690V AC phase-phase value	Generator voltage L1
80	Not used		
81	U L2	Max. 690V AC phase-phase value	Generator voltage L2
82	Not used		
83	U L3	Max. 690V AC phase-phase value	Generator voltage L3
84	U neutral		Generator voltage neutral
85	U BB L1	Max. 690V AC phase-phase value	Busbar voltage L1
86	Not used		
87	U BB L2	Max. 690V AC phase-phase value	Busbar voltage L2
88	U neutral		Busbar voltage neutral
89	U BB L3	Max. 690V AC phase-phase value	Busbar voltage L3

2.7 Basic utility software setup

2.7.1 General

This chapter describes the minimum requirements for setup in order to achieve the functionali-ties mentioned in the chapter "Functional description".

This unit uses the PC utility software version 3 (USW 3) which can be downloaded free of charge at www.de-if.com.

For more details on how to set up the unit, please refer to the documents "Quick Start Guide" and "General Guidelines for Commissioning".

2.7.2 Parameters

The following parameter has to be adjusted for this application:

Parameter no.	Function	Setting
2240 Sep Sync relay	Separate sync. relay	Relay 08

Please refer to the document "Parameter List" for a complete list of settings.

2.8 Flowchart

2.8.1 Synchronisation sequence