



-power in control



MULTI-LINE 2 DESCRIPTION OF OPTIONS



Option M12

Configurable I/O extension cards, 13 binary inputs/ 4 relay outputs

- Description of option
- Functional description



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

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1. Delimitation

1.1 Scope of option M12

This description of options covers the following products:

AGC-3	SW version 3.4x.x or later
AGC-4	SW version 4.0x.x or later
GPU/GPU Hydro	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



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.

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.



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.

2.1.3 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.

2.1.4 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.

2.1.5 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.

3. Description of option

3.1 Option M12

Option M12 is a hardware option, and therefore an extra PCB is placed in slot #3 in addition to the standard-installed hardware.

3.2 ANSI numbers

Function	ANSI no.
13 x binary inputs for control and/or alarms	77
4 x digital outputs	74



AGC: if option G3 is already installed, option M12 is a software upgrade.

3.3 Terminal descriptions

3.3.1 Terminal description, AGC

Term.	Function	Technical data	Description
37	Used for the option G3		
38			
39			
40	-10...0...10V DC	Analogue I/O	f/P setpoint
41	Com.	Common	Common
42	-10...0...10V DC	Analogue I/O	U/Q setpoint
43	Digital input 43	Optocoupler	Configurable
44	Digital input 44	Optocoupler	Configurable
45	Digital input 45	Optocoupler	Configurable
46	Digital input 46	Optocoupler	Configurable
47	Digital input 47	Optocoupler	Configurable
48	Digital input 48	Optocoupler	Configurable
49	Digital input 49	Optocoupler	Configurable
50	Digital input 50	Optocoupler	Configurable
51	Digital input 51	Optocoupler	Configurable
52	Digital input 52	Optocoupler	Configurable
53	Digital input 53	Optocoupler	Configurable
54	Digital input 54	Optocoupler	Configurable
55	Digital input 55	Optocoupler	Configurable
56	Com.	Common	Common for terminals 43 to 55
57	NE/ND	Relay 57	Configurable
58	Com.	250V AC/5 A	
59	NE/ND	Relay 59	Configurable
60	Com.	250V AC/5 A	
61	NE/ND	Relay 61	Configurable
62	Com.	250V AC/5A	
63	NE/ND	Relay 63	Configurable
64	Com.	250V AC/5 A	



Please refer to the Installation Instructions for detailed description of the wiring of digital inputs.

3.3.2 Terminal description, GPU/GPU Hydro

Term.	Function	Technical data	Description
37	Not used		
38			
39			
40			
41			
42			
43	Digital input 43	Optocoupler	Configurable
44	Digital input 44	Optocoupler	Configurable
45	Digital input 45	Optocoupler	Configurable
46	Digital input 46	Optocoupler	Configurable
47	Digital input 47	Optocoupler	Configurable
48	Digital input 48	Optocoupler	Configurable
49	Digital input 49	Optocoupler	Configurable
50	Digital input 50	Optocoupler	Configurable
51	Digital input 51	Optocoupler	Configurable
52	Digital input 52	Optocoupler	Configurable
53	Digital input 53	Optocoupler	Configurable
54	Digital input 54	Optocoupler	Configurable
55	Digital input 55	Optocoupler	Configurable
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62	Com.	250V AC/5 A	
63	NE/ND	Relay 63	Configurable
64	Com.	250V AC/5 A	



Please refer to the Installation Instructions for detailed description of the wiring of digital inputs.

4. Functional description

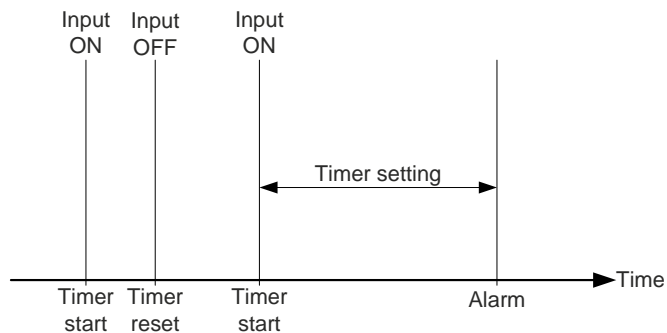
4.1 Digital inputs

The digital inputs available in this option can be used for two purposes:

1. Protection (alarm) inputs
2. Function inputs

4.2 Protection/alarm inputs

The delay settings are all of the definite time type, i.e. a set time is selected. The delay will be activated if the input goes ON (or OFF if selected to be N/C). If the input is reset before the delay runs out, the delay will be reset.



When the delay runs out, the output will be activated.

4.2.1 Function input

The function inputs can be set up via the PC utility software.

The PC utility software is a Windows®-based software, which can be downloaded from our website www.de-if.com. To adjust the inputs via the PC utility software, a computer must be connected to the controller unit. Furthermore, the unit parameters must be uploaded to the computer.



Please refer to the Designer's Reference Handbook for a complete list of the available input functions.

4.3 Relay setup

Each relay has a function and an OFF delay setting as described below.

Function	Description
Alarm relay NE	When the relay is activated, an alarm is displayed. The relay will remain activated for as long as the alarm is present and unacknowledged.
Alarm relay ND (GPU/GPU Hydro only)	When the relay is activated, an alarm is displayed. The relay will remain activated for as long as the alarm is present and unacknowledged.
Alarm/reset (GPU/GPU Hydro only)	The functionality is similar to "Alarm", but with a short-time reset if the relay is ON and another alarm tries to activate the same relay.
Limit relay	When the relay is activated, no alarm message is displayed. After the condition activating the relay has returned to normal, the relay will deactivate when the "OFF delay" has expired.
Horn relay	When the relay is activated, an alarm message is displayed. The relay will be activated until the time set in menu 6130 "Alarm horn" has expired or the alarm activating the relay has been acknowledged.
Siren relay (GPU/GPU Hydro only)	The output activates on all alarms, like "Horn output". If the relay is ON and another alarm is active, a short-time reset = 1 s will be activated.
OFF delay	The "OFF delay" is used when limit relay is selected. It is the time between the disappearance of the event that caused the relay to activate and the actual deactivation of the relay.

 **It is possible to configure the relay outputs to be used for speed and/or voltage regulation. Please refer to the Designer's Reference Handbook.**

 **The relays can also be used together with M-logic. Please refer to the help function in the PC utility software.**

4.4 External analogue setpoints

4.4.1 AGC

The genset can be controlled from internal as well as from external setpoints. The external setpoints are activated with a digital signal.

Five inputs can be selected, and their function depends on the mains breaker position.

Input	Frequency	Power	Voltage	Reactive power	Power factor
Island mode, stand-alone	X		X		
Island mode, load sharing	X		X		
Parallel to the mains		X		X	X

The controller setpoints will be ignored if the running condition is not present. For instance, it is not possible to use the frequency controller when paralleling to the mains.

The table below shows the setpoints.

Controller	Input voltage	Description	Comment
Frequency	+/-10V DC	$f_{NOM} \pm 5 \text{ Hz}$	Active when MB is OFF
Power	+/-10V DC	$\pm 100\% * P_{NOM}$	
Voltage	+/-10V DC	$U_{NOM} \pm 10\%$	Active when GB is OFF
Reactive power	+/-10V DC	$\pm 100\% * Q_{NOM}$	
Power factor	$\pm 10 \text{ V} \dots 0 \dots 10 \text{ V DC}$	0.6 capacitive...1.0...0.6 inductive	

The external setpoints can be used in all genset modes when auto or semi-auto mode is selected.



Only a limited number of digital inputs are available in the standard unit. The unit should be installed with the sufficient number of options to get the desired digital inputs.



If the option H2 is available in the unit, the external setpoints can be controlled from the control registers in the Modbus protocol. Please refer to the description of option H2 for further information.

5. Parameters

5.1 Further information

The option M12 relates to the parameters 3130-3250 and 5110-5140.

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

AGC-3	Document number 4189340705
AGC-4	Document number 4189340688
GPC-3/GPU-3 Hydro	Document number 4189340580
PPU-3/GPU-3	Document number 4189340581