DEIF

-power in control

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# INSTALLATION INSTRUCTIONS AND REFERENCE HANDBOOK

# Genset Controller, GC-1F

- Installation instructions
- Functional description
- Parameter list

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This description includes the following versions:

| | |
|---|---|
| GC-1F | SW version 1.2x.x |
| GC-1F/2 | SW version 2.x.x or later |

Table of contents

# 1. About this document

This chapter includes general user information about this handbook concerning the general purpose, the intended users, the overall purpose and the overall contents and structure.

## General purpose

This document is the Installation Instructions and Reference Handbook for DEIF's Genset Controller, the GC-1F. The document mainly includes installation instructions, presentation of push-buttons, LEDs and display, functional descriptions and complete standard parameter lists.

The general purpose of the Installation Instructions and Reference Handbook is to provide the information needed to install the unit correctly and to provide information about the functionality of the unit and its applications. The handbook also offers the user the information he needs in order to successfully set up the parameters needed in his specific application.

**Make sure to read this handbook before working with the Multi-line 2 controller and the genset to be controlled. Failure to do this could result in human injury or damage to the equipment.**

## Intended users

The handbook is mainly intended for the person responsible for installing the unit and for the person responsible for the unit setup. Naturally, others might also find useful information in the handbook.

## Contents/overall structure

The Installation Instructions and Reference Handbook is divided into chapters and in order to make the structure of the document simple and easy to use, each chapter will begin from the top of a new page. The following will outline the contents of each of the chapters.

### About this document

This first chapter includes general information about this handbook as a document. It deals with the general purpose and the intended users of the Installation Instructions and Reference Handbook. Furthermore, it outlines the overall contents and structure of the document.

### Warnings and legal information

The second chapter includes information about general legal issues and safety precautions relevant in the handling of DEIF products. Furthermore, this chapter will introduce note and warning symbols, which will be used throughout the handbook.

### General product information

The third chapter will deal with the unit in general and its place in the DEIF product range.

### Installation instructions

This chapter includes the information needed to perform correct installation of the unit, for example mounting instructions, terminals, wiring, inputs, and so on

### Push-buttons, LEDs and display

This chapter deals with push-button and LED functions. Furthermore, information about the display including icon list is presented.

### Functional descriptions

This chapter includes functional descriptions for the unit's standard functions. Screen dumps and flow charts are used in order to simplify the information.

### Parameter list

This chapter includes a complete standard parameter list for setup. Therefore, this chapter is to be used for reference, when information about specific parameters is needed.

# 2. Warnings and legal information

This chapter includes important information about general legal issues relevant in the handling of DEIF products. Furthermore, some overall safety precautions will be introduced and recommended. Finally, the highlighted notes and warnings, which will be used throughout the document, are presented.

## Legal information and disclaimer

DEIF takes no responsibility for installation or operation of the genset. 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.**

**Disclaimer**
DEIF A/S reserves the right to change any of the contents of this document without prior notice.

The English version of this document always contains the most recent and up-to-date information about the product. DEIF does not take responsibility for the accuracy of translations, and translations might not be updated at the same time as the English document. If there is a discrepancy, the English version prevails.

## 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.**

## Factory settings

The unit is delivered with certain factory settings. Given the fact that these settings are based on average values, they are not necessarily the correct settings for matching the individual engine. Thus precautions must be taken to check the settings before running the engine.

## 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.**

**Warnings**

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

## UL applications

These flat surface panel-mounted controllers are intended to be used in Listed Generator Assemblies, where the suitability of the combination has been determined by Underwriters Laboratories.

# 3. General product information

This chapter includes overall product information about the unit in general and its place in the DEIF product range.

## Introduction

The concept of the GC-1F is to offer a simple and effective solution to genset builders, who need a flexible yet cost-competitive protection and control unit for small and medium-sized generators.

## Type of product

The Generator Controller GC-1F is a microprocessor-based control unit containing all necessary functions for protection and control of a power generator. Besides the control and protection of the diesel engine it contains a full 3-phase AC voltage and current measuring circuit. The unit is equipped with an LCD display presenting all values and alarms.

## Standard functions

**Engine control**

- Start preparation (pre-heating or pre-lubrication)
- Start/stop sequences with selectable number of start attempts
- Fuel solenoid selection (coil type)
- Idle speed control
- Local or remote start/stop
- Stop sequence with cooling down
- Command timers
- Shut down override (fire pump)
- Fuel logic
- Running feedback detection selectable
  - Generator Hz/V
  - Charger alternator input (W terminal)
  - Binary input (D+)
  - Oil pressure
  - RPM input

**Engine monitoring**

- Three configurable inputs, all selectable between
  - RMI or
  - 0(4) to 20 mA from active transducer or
  - Binary with wire break
  - Six binary inputs, configurable
- RPM input, selectable
  - Magnetic pickup
  - NPN or PNP pickup
  - Tacho generator
  - Charger alternator W terminal

**Generator monitoring**

- 3-phase or single phase generator monitoring
  - Voltage/current/frequency/power factor/power/reactive power

**Mains monitoring**

- 3-phase or single phase generator monitoring
  - Voltage/frequency

**Generator protection (ANSI)**

- Over-/under-voltage (27/59)
- Over-/under-frequency (81)
- Over-current (50/51)
- Overload (32)
- Reverse power (32)
- Phase sequence error (47)

**Mains protection (ANSI)***

- Over-/under-voltage (27/59)
- Over-/under-frequency (81)

***Only HW 1.05 and SW 2.2x.x**

**M-Logic**

- Simple logic configuration tool
- Selectable input events
- Selectable output commands

**Display panel**

- 128 × 64 pixel backlight STN
- Alarm texts editable
- All texts in multi-language
- Clear text alarm messages
- Clear text diagnostics for both hardwired inputs and CAN bus messages (J1939)
- Log book holding 150 log entries
- Real time clock for time and date

## Options

The basic GC-1F genset controller unit can be equipped with an AMF and option needed to provide a real emergency power system controller. Furthermore, CAN bus communication for different engine types is available, and CAN bus for up to two AOPs is possible at the same time. Also Modbus RS-485 is available as an option.

**A full options list is included in the data sheet.**

# 4. Installation instructions

This chapter includes the information needed to perform correct installation of the unit, for example mounting instructions, terminals, wiring, inputs, and so on

## Mounting

The unit is designed for flush mounting by means of 4 fixing clamps (IP52), which are included at delivery. To have the IP65 (12 fixing clamps), the unit must be ordered with option L. The two fixing clamps on each side are mounted on the top and bottom of the GC-1F box.

### Mounting of the unit

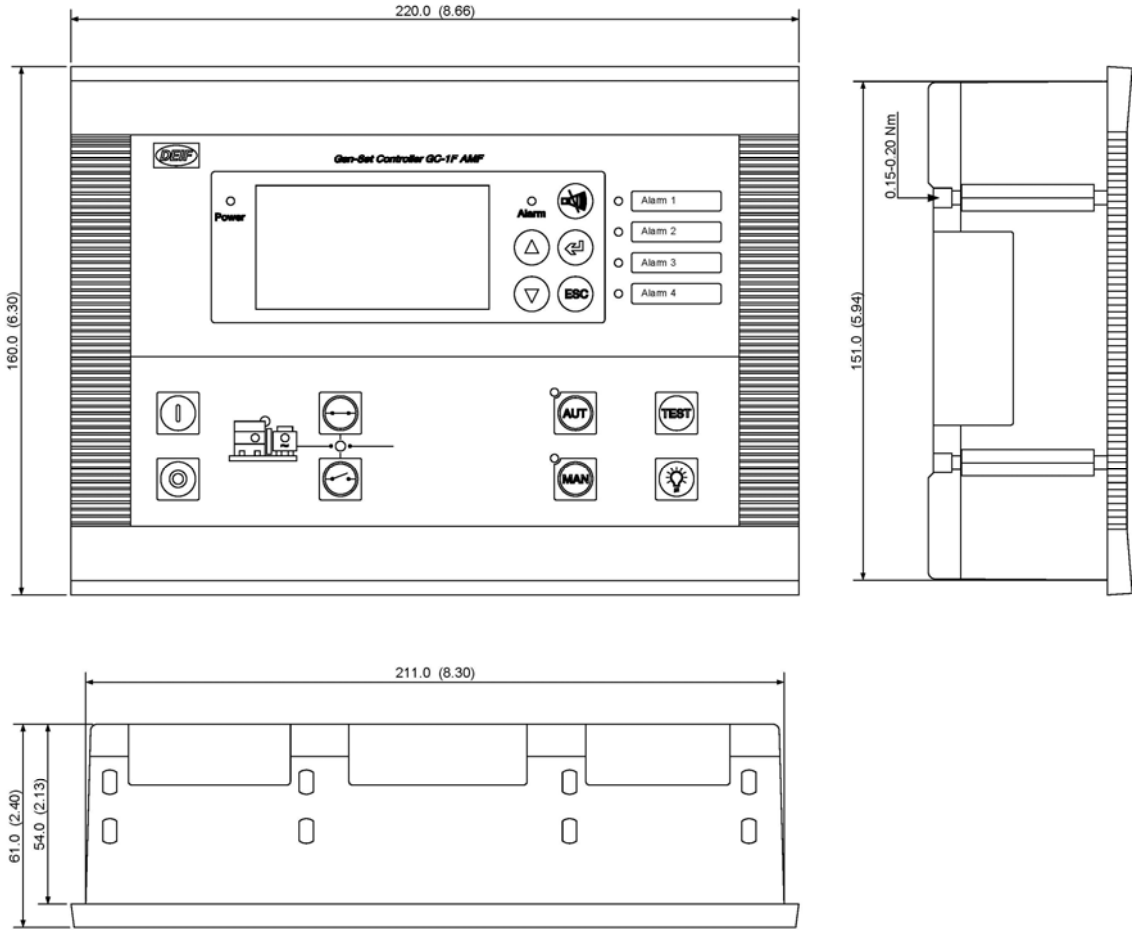
The unit is designed for mounting in the panel front.

In order to ensure optimum mounting, the panel door must be cut out according to the following measurements:

H × W = 151.00 × 211.00 + 1.00 mm

H × W = 5.94" × 8.31" + 0.04"

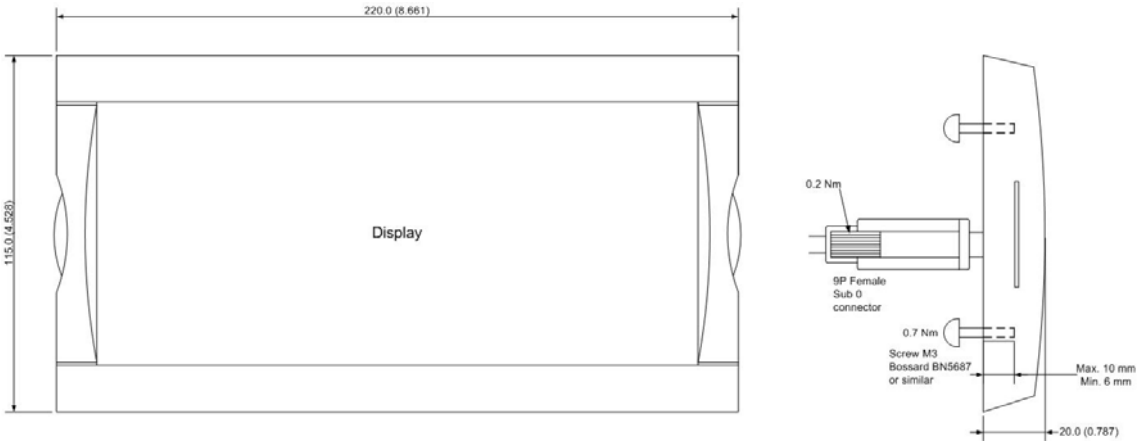
### Unit dimensions



**Tightening torques**

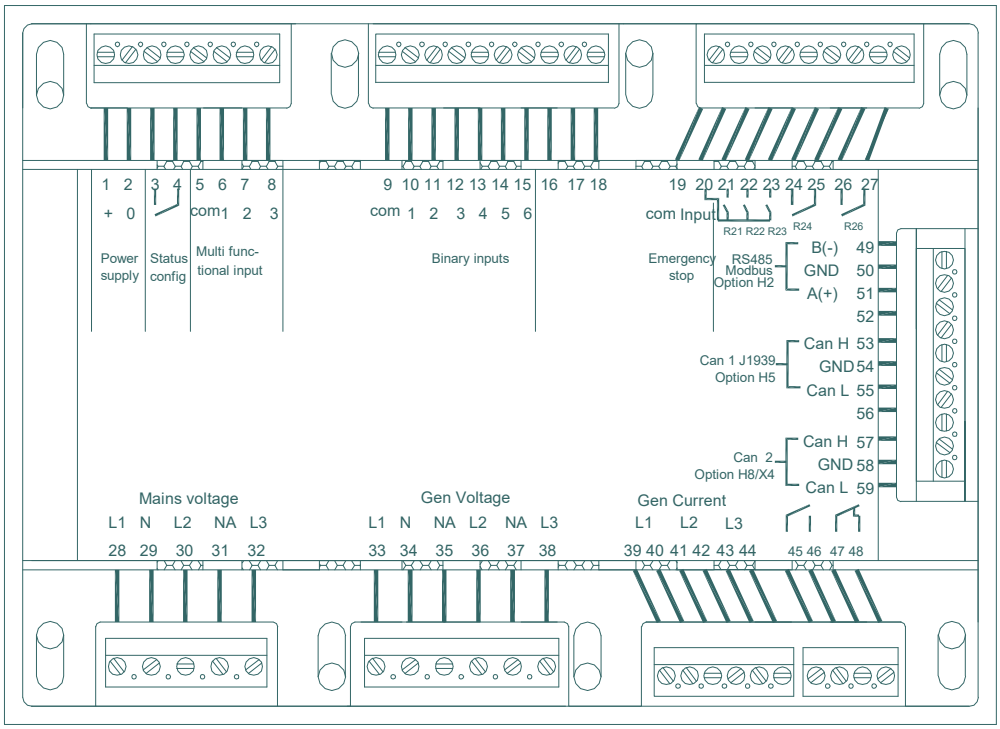
Unit panel door mounting: 0.15-0.20 Nm (see diagram in "Unit dimensions ")
Plug connections (terminals): 0.5 Nm

AOP-1 and AOP-2 (see diagram below)
Panel door mounting: 0.7 Nm
Sub-D screw: 0.2 Nm
DC-DC converter terminals: 0.5 Nm



# Terminals

## Unit rear view




**The RJ11 connector for the PC connection interface box is placed on the side of the unit.**

**Term. 3-4, status relay is only configurable in HW 1.05 and SW 2x.x.**

## Terminal description

**For the relay outputs the following terms will be used:**

**NO means Normally Open.**
**NC means Normally Closed.**
**Com. means common terminal for the individual relay.**

| Term. | Technical data | Description |
|---|---|---|
| 1 | Power supply + | Aux. supply |
| 2 | Power supply – | GND |
| 3-4 | Status out/configurable. Contact ratings 1 A 24 V DC/ V AC Resistive | General status output for marine approvals** Configurable only available from HW 1.05 and sw 2.x.x |
| 9 | Common | Common for term. 10 to 15 |
| 10 | Digital input | Start enable/configurable |
| 11 | Digital input | Remote start/stop/configurable |
| 12 | Digital input | Charge alternator D+ (running)/configurable |
| 13 | Digital input | Configurable |
| 14 | Digital input | Coolant temperature/configurable |
| 15 | Digital input | Oil pressure/configurable |
| 19 | Common | Common for emergency stop term. 20 |
| 20 | Emergency stop and common for 21 to 23 | Common for relay 21, 22 and 23 and input for emergency stop* |
| 21 | Relay output 21. Contact ratings 2 A 30 V DC/V AC (UL/cUL Listed: 1 A Resistive) | Start prepare/configurable. Function NO |
| 22 | Relay output 22. Contact ratings 2 A 30 V DC/V AC (UL/cUL Listed: 1 A Resistive) | Starter (crank)/configurable. Function NO |
| 23 | Relay output 23. Contact ratings 2 A 30 V DC/V AC (UL/cUL Listed: 1 A Resistive) | Run coil/configurable. Function NO |
| 24-25 | Relay output 24. Contact ratings 8 A 30 V DC/V AC (UL/cUL Listed: 6 A Resistive) | Horn/configurable. Function NO |
| 26-27 | Relay output 26. Contact ratings 8 A 30 V DC/V AC (UL/cUL Listed: 6 A Resistive) | Alarm/configurable. Function NO |
| **Multi-functional inputs** | | |
| 5 | Common | Common for term. 6 to 8 |
| 6 | RMI1/0(4) to 20 mA/binary input | Fuel level/configurable |
| 7 | RMI2/0(4) to 20 mA/binary input | Oil pressure/configurable |
| 8 | RMI 3/0(4) to 20 mA/binary input | Water temp./configurable |
| **Tacho RPM input** | | |
| 16 | RPM input (MPU) | Magnetic pickup/tacho generator |
| 17 | RPM-GND | Common for RPM input |
| 18 | RPM input (W/L) | Magnetic pickup. PNP, NPN or charge alternator W terminal |
| **3-phase generator voltage input** | | |
| 33 | Gen. voltage L1 | Generator voltage and frequency |
| 34 | Gen. neutral | |
| 35 | Not used, must not be connected | |
| 36 | Gen. voltage L2 | |
| 37 | Not used, must not be connected | |
| 38 | Gen. voltage L3 | |
| **3-phase generator current input** | | |
| 39 | Gen. current L1, s1 | Generator current |
| 40 | Gen. current L1, s2 | |
| 41 | Gen. current L2, s1 | |
| 42 | Gen. current L2, s2 | |
| 43 | Gen. current L3, s1 | |

| | | |
|---|---|---|
| 44 | Gen. current L3, s2 | |
| **3-phase mains voltage inputs** | | |
| 28 | Mains voltage L1 | |
| 29 | Mains voltage neutral | |
| 30 | Mains voltage L2 | |
| 31 | Not used, must not be connected | |
| 32 | Mains voltage L3 | |
| **Breaker relays** | | |
| 45 | Relay R45. Contact ratings 2 A 30 V DC/250 V AC (UL/cUL Listed: Contact ratings 2 A 30 V DC/30 V AC) | Generator circuit breaker/configurable, function NO (normally open). |
| 46 | Relay R45 | |
| **Optional relay for closing mains breaker (option B3)** | | |
| 47 | Relay R47. Contact ratings 2 A 30 V DC/250 V AC (UL/cUL Listed: Contact ratings 2 A 30 V DC/30 V AC) | Mains circuit breaker/configurable, function NC (normally closed). Option B3 |
| 48 | Relay R47 | |
| **Optional relay NO contact (option M19)** | | |
| 47 | Relay R47. Contact ratings 2 A 30 V DC/250 V AC (UL/cUL Listed: contact ratings 2 A 30 V DC/30 V AC) | Mains circuit breaker/configurable, function NO (normally open) |
| 48 | Relay R47 | |
| **Optional Modbus RS-485 interface (option H2)** | | |
| 49 | B (-) | Modbus RS-485 RTU or ASCII |
| 50 | GND | |
| 51 | A (+) | |
| **Optional CAN bus port #1: Engine interface (option H5)** | | |
| 53 | CAN-H | CAN J1939 engine communication |
| 54 | CAN-GND | |
| 55 | CAN-L | |
| **Optional CAN bus port #2: AOP-2 (option X4)** | | |
| 57 | CAN-H | CAN communication line to AOP-2 |
| 58 | CAN-GND | |
| 59 | CAN-L | |
| **Optional CAN bus port #2: External I/O interface (option H8)** | | |
| 57 | CAN-H | CAN communication port to external I/O |
| 58 | CAN-GND | |
| 59 | CAN-L | |

* If terminal 20 is used for emergency stop, see wiring diagram below.

** The status relay is the uP watchdog output. This relay is normally energised, and the switch is closed after power-up. If the uP fails or the power is lost, the relay will deenergise and the switch will open. If the unit fails to start up at power-up, then the relay switch will remain open.

*The relay output functions are configurable via the PC utility software and can be configured to cover the following functions:*

- Alarm/limit
- Engine run indication
- Horn
- Idle speed output
- Not used
- Prepare
- Run coil
- Starter
- Stop coil
- Engine heater
- Stop coil (not acc. in start seq.)
- Fuel pump

It is possible to choose run coil on one relay and stop coil on another, thus supporting engines with double systems.

*The multi-functional inputs can be configured to cover the following functions:*

- RMI sensor input
- 0 to 20 mA input
- 4 to 20 mA input
- Binary input with wire break (switch function)

*Tacho RPM input (MPU) can be configured to cover the following functions:*

- Magnetic pickup (2-wire)
- NPN or PNP pickup*

* These RPM inputs require external equipment.

*Tacho RPM input with capacitor (W/L) can be configured to cover the following functions:*

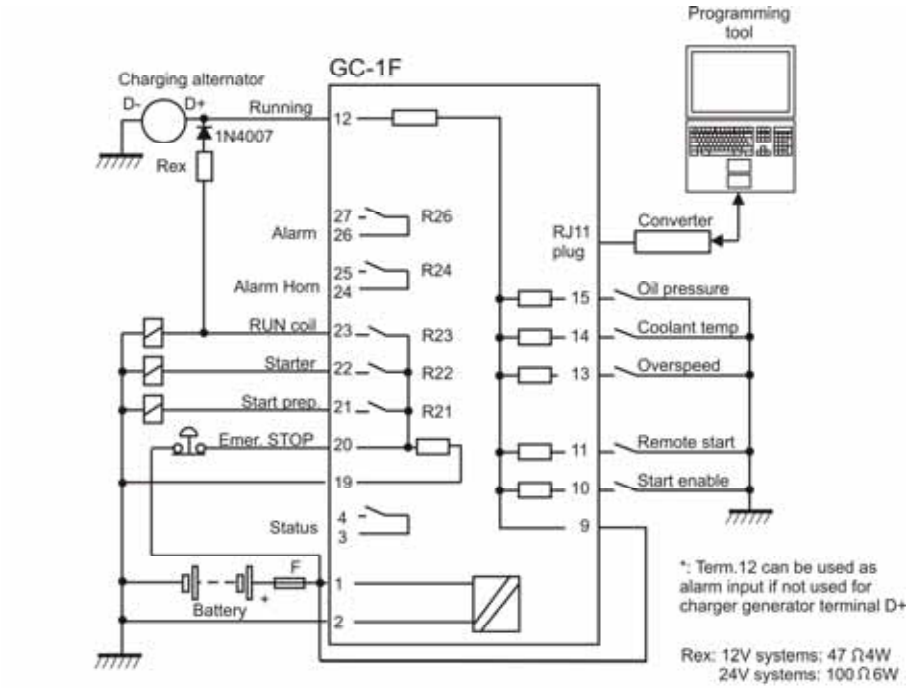
- Magnetic pickup (2-wire)
- W terminal on charger alternator
- NPN or PNP pickup*

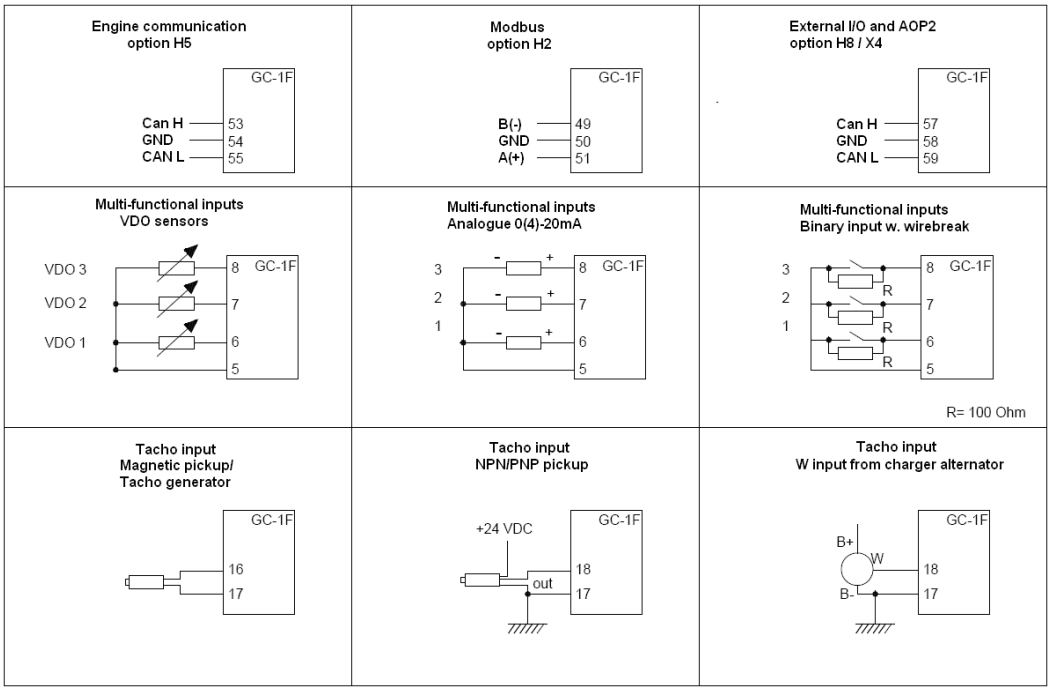
* These RPM inputs require external components.

*The generator voltage and current input can be configured to the following:*

- Voltage 100 to 25000 V primary
- Current 5 to 9000 A primary

## Wiring



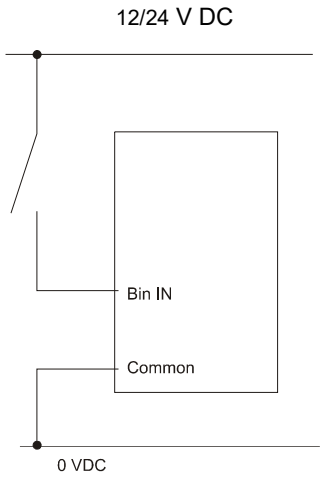

**If a stop coil is used, the REX resistor can be connected to the starter relay (crank).**

**The illustrated configuration is the default factory setting. The use of the relays can be chosen freely.**

**It is important to protect the unit against damage caused by high voltages. Therefore, the fuse must not be more than 2 A.**

## Binary inputs

All binary inputs are 12/24 V DC bi-directional optocoupler type. The typical wiring is illustrated below:




**The binary inputs use fixed signals. Only the mode shift input and the test input (if the timer is used) use pulse signal.**

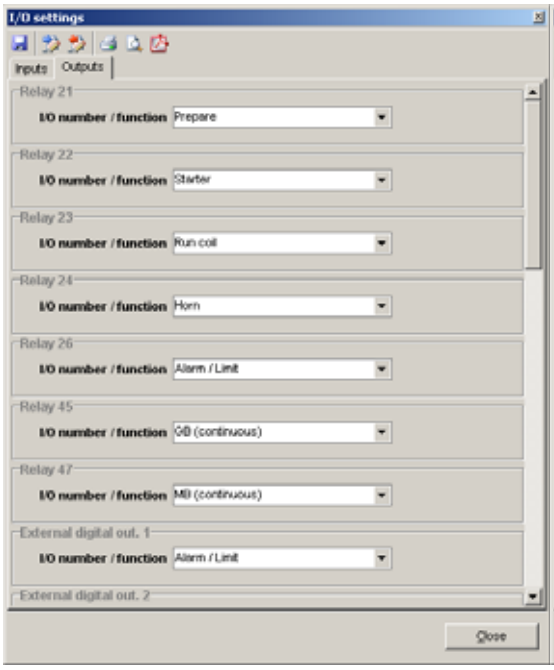
## Breaker selection

The GC-1F can handle contactors and pulse breakers. Selection of breaker type is done under output setting.

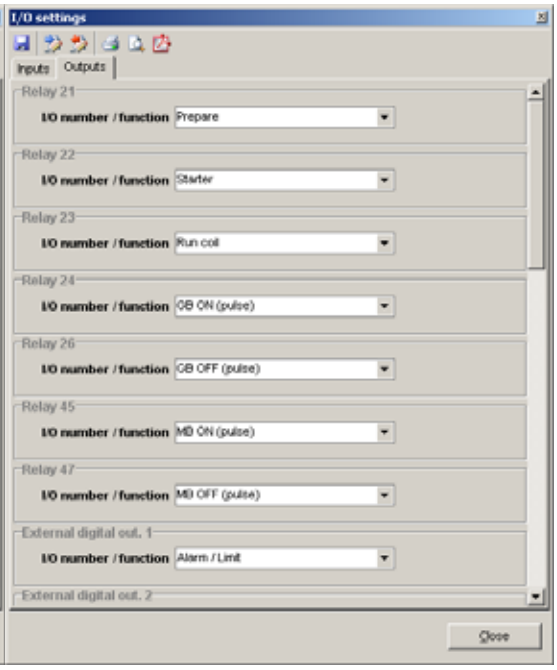
Pulse breaker: GB ON + GB OFF

GB pulse ON time: GB ON + GB OFF can be set in menu 6234

Continuous breaker: GB continues




Continuous breaker selection




Pulse breaker selection

**GC-1Fs ordered with option M19 will have relay 47 with NO contact.**

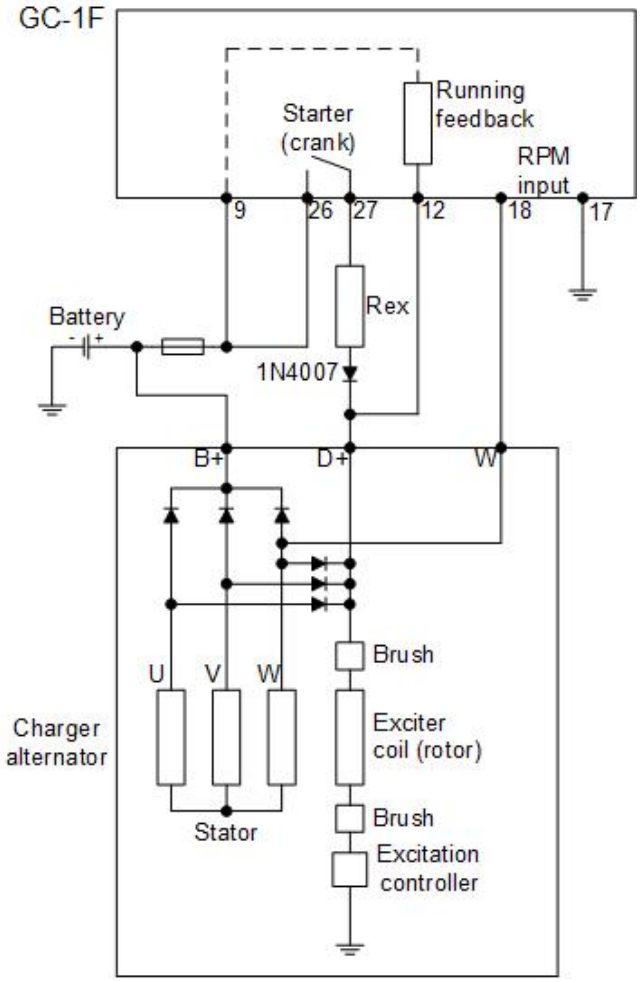
**Pulse breakers are only available in HW 1.05 and SW 2.x.x**

## Charger alternator connections

The charger alternator can be used as running-feedback in 2 different ways:

1) Using the D+ terminal connected to terminal 12
2) Using the W terminal connected to the RPM input

**Usually only one of these possibilities is used.**



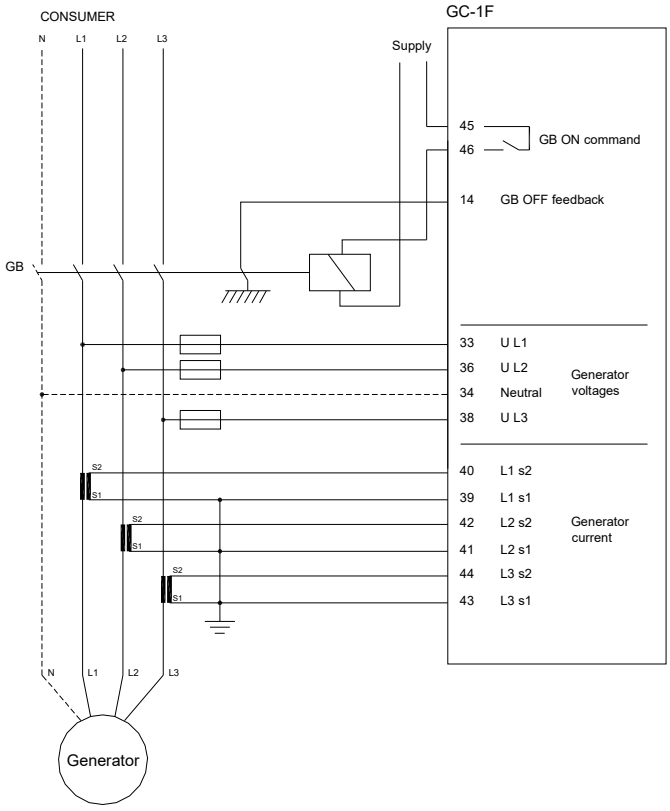

| | |
|---|---|
| **Rex: Excitation resistor** | 12 V systems: 47 Ω 4 W |
| | 24 V systems: 100 Ω 6 W |

At standstill the battery + is connected to terminal 9 (common), and a current flows to terminal 12 and via the D+ input on the alternator to ground (battery -). When the starter is engaged (cranking), the battery will supply the D+ through the REX resistor, helping the alternator to excite. When the alternator starts to produce voltage (excitation OK), the speed of the alternator will be above running speed, and the voltage on term. 12 will rise to a value higher than the battery voltage and then interrupt the current flow through REX and activate the running feedback input. Engine is running.

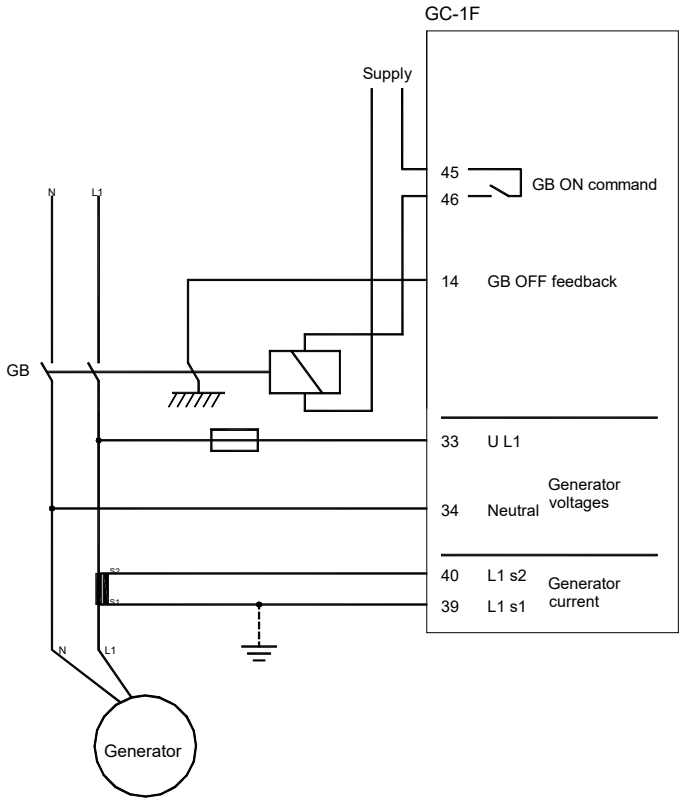
**If a stop coil is used, the REX resistor can be connected to the starter relay (crank).**

## Connection of the 3-phase voltage and current

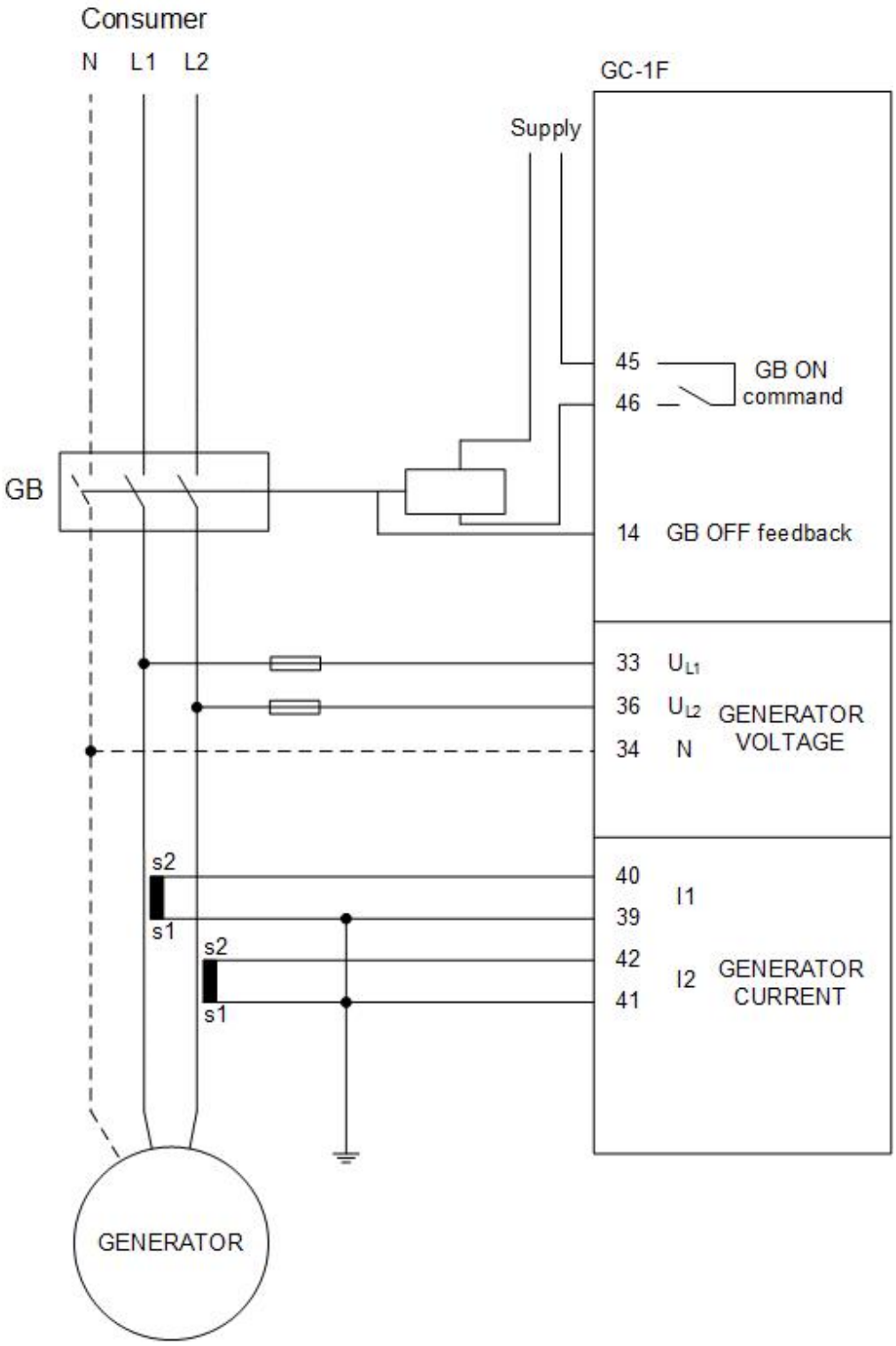
### Wiring, AC interface




## Connection of the 1-phase voltage and current



## Connection of the split-phase voltage and current

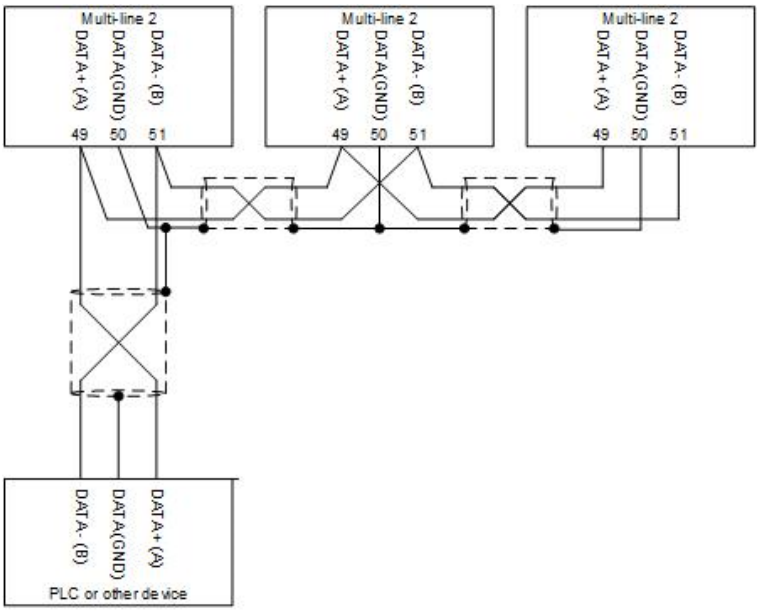



**Voltage measurement fuses:**
**If the wires/cables are protected with fuses, use 2 A slow blow or higher, dependent on the wires/cables being protected.**

# Communication

## Wiring instructions

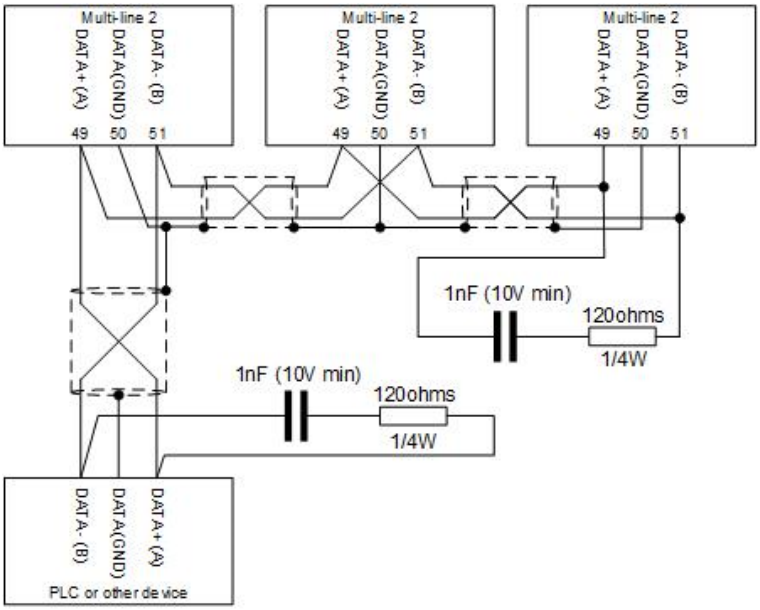
Option H2, Modbus RTU
Connection with 2-wire shielded cable:



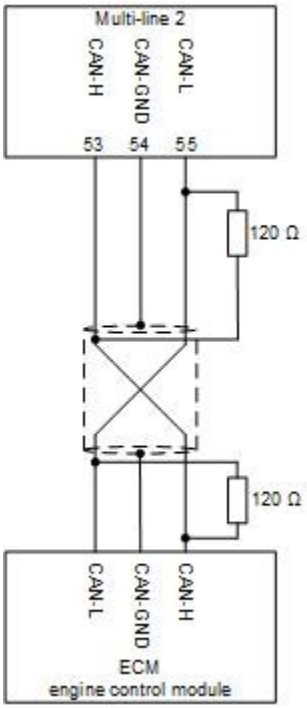

**We recommend a maximum length of 300 m for the total Modbus line.**

**Cable: Belden 3105A or equivalent. 22 AWG (0.6 mm$^2$) twisted pair, shielded, <40 mΩ/m, min. 95 % shield coverage.**

**The RS-485 Modbus lines need end resistors (end terminators) when the bus length exceeds 30 m. If end resistors are needed, we recommend to install them like this:**



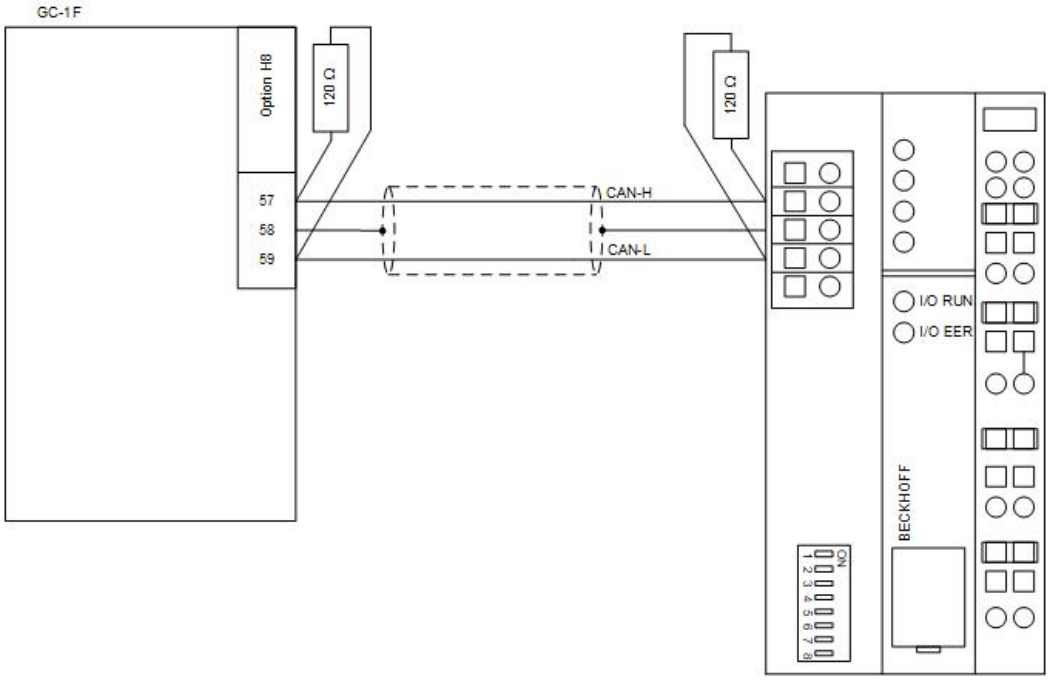
Option H5, CAN bus engine communication
Connection with 2-wire shielded cable:




**We recommend a maximum length of 300 m for the total CAN bus line.**

**Cable: Belden 3105A or equivalent. 22 AWG (0.6 $mm^2$) twisted pair, shielded, <40 mΩ/m, min. 95 % shield coverage.**

Option H8, external I/O modules

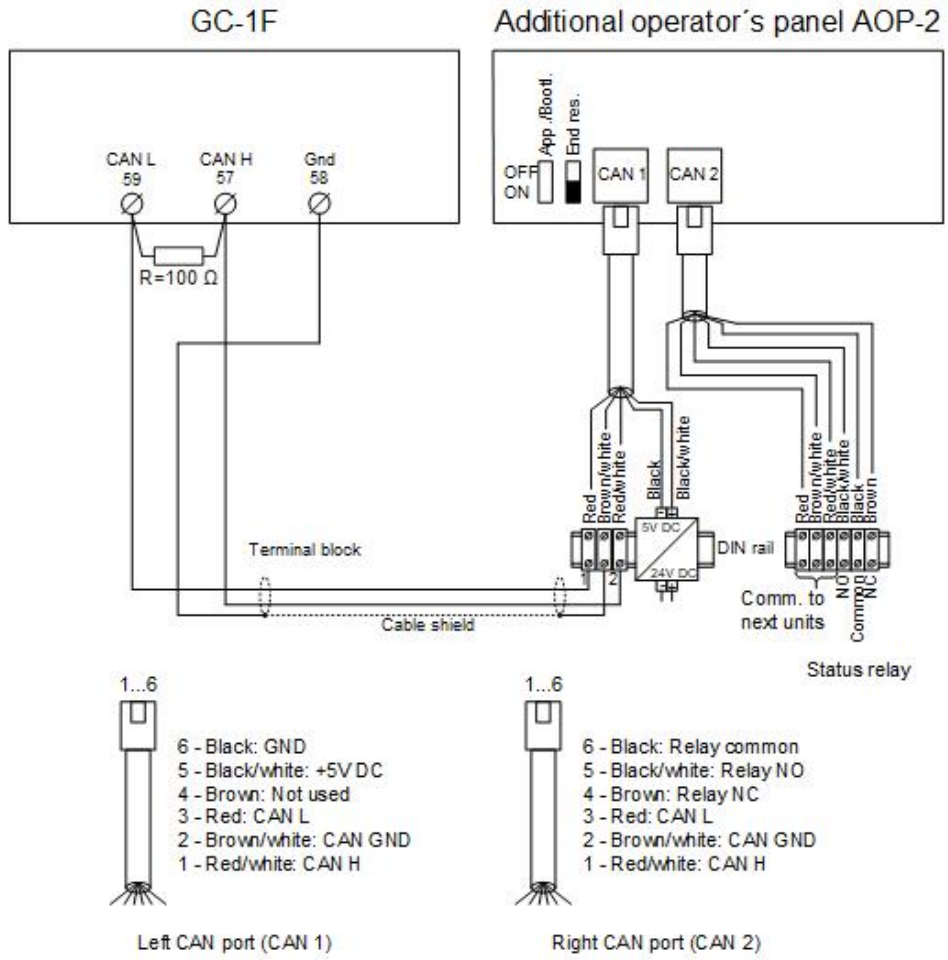



**If option H8 is used together with AOP-2, the total terminal resistance of the AOP-2 and the external I/O controller must be 120 Ω.**

**We recommend a maximum length of 300 m for the total CAN bus line.**

**Cable: Belden 3105A or equivalent. 22 AWG (0.6 mm$^2$) twisted pair, shielded, <40 mΩ/m, min. 95 % shield coverage.**

Option X4, additional operator panel AOP-2




**For wiring details, refer to 'Wiring instructions' in this section.**

**If option H8 is used together with AOP-2, the total end resistance of the AOP-2 and the external I/O controller must be 120 Ω.**

**A DC/DC converter for the DC supply voltage and 2 × 1 m cable with an RJ12 plug in one end and stripped wires in the other end are included in the AOP-2 delivery.**

# Technical information

## Technical specifications

| | |
|---|---|
| **Accuracy:** | Class 2.0<br>To IEC/EN 60688 |
| **Operating temp.:** | -20 to 70 °C (-4 to 158 °F)<br>(UL/cUL Listed: Max. 50 °C ambient) |
| **Storage temp.:** | -40 to 70 °C (-40 to 158 °F) |
| **Heat foil (option L2):** | Display will operate at -40 °C (-40 °F) |
| **Measuring input voltage:** | 50 to 480 V AC (+20 %)<br>Phase to phase |
| Load: | 1.5 MΩ/phase |
| **Frequency:** | 30 to 70 Hz |
| **Measuring input current**: | 1A or 5 A AC from current transformer<br>(UL/cUL Listed: Use listed or R/C (XODW2.8) current transformers |
| Current overload: | 4 × In continuously<br>20 × In, 10 s (max. 75 A)<br>80 × In, 1 s (max. 250 A) |
| Short-circuit protection: | 3 % of 350 %*In (only HW 1.05 and 2.0x.x) |
| Consumption, max.: | 0.3 VA/phase |
| **Pickup input voltage:** | 2 to 70 V peak |
| Frequency: | 10 to 10000 Hz |
| **Aux. supply:** | 6 to 36 V DC continuously<br>(UL/cUL Listed: 7.5 to 32.7 V DC)<br>Max. 8 W consumption<br>With L2 heatfoil, max. 16 W |
| **Passive binary input voltage:** | Bi-directional optocoupler<br>6 to 36 V DC |
| Impedance: | 4.7 kΩ |
| **Dropout cranking:** | Able to survive 0 V for 50 ms at<br>12 V DC aux. supply before dropout |
| **RMI inputs:** | Resistor inputs 0-2500 ohm, internal 3 V supply |
| **Analogue input:** | (0)4 to 20 mA from active transducer |
| Input impedance: | 50 Ω |

**Active binary input voltage:** Dry contact inputs (see note)
3 V DC supply, with cable supervision

**Relay outputs:**

| | |
|---|---|
| Impedance: | 240 Ω ~ 16 mA |
| Relays 21-23: | 30 V DC/AC 2 A<br>(UL/cUL Listed: 1 A Resistive) |
| Relays 45,47: | 250 V AC/30 V DC 2 A<br>(UL/cUL Listed: 30 V DC/AC 2 A Resistive) |
| Relays 24,26: | 30 V DC/AC 8 A<br>(UL/cUL Listed: 6 A Resistive) |
| 1 status/config.<br>Relay 3-4: | 24 V DC 1 A Resistive |

**Response times:**
(Delay set to min.)

Generator:

| | |
|---|---|
| Reverse power | < 400 ms |
| Power/overload | < 400 ms |
| Over-current | < 400 ms |
| Over-/under-voltage | < 400 ms |
| Over-/under-frequency | < 400 ms |
| Fast over-current | < 300 ms |

**Mounting:** Panel-mounted
(UL/cUL Listed: For use on a flat surface of a type 1 enclosure. Main disconnect must be provided by installer)

**Size:** 160 × 220 mm (6.30” × 8.66”)

**Climate:** 97 % RH to IEC 60068-2-30, test Db
-20(-40) °C to IEC 60068-2-1
+70 °C to IEC 60068-2-2

**Display:** 128 × 64 pixel backlight STN
3 line views can max. show a value of 9999

**Safety:** To EN 61010-1, UL508 and CSA22.2 No. 14-05
Installation category (over-voltage category) III, 300 V, pollution degree 2

**Protection:** Front: IP52/NEMA type 1
(IP65/NEMA type 1 with gasket, option L)
Terminals: IP20/NEMA type 1
To IEC/EN 60529

**EMC/CE:** To EN 61000-6-1/2/3/4
IEC 60255-26

**Material:** All plastic materials are self-extinguishing acc. to UL94 (V1)

**Plug connections:**

| | |
|---|---|
| AC voltage/current inputs: | 3.5 $mm^2$ (13 AWG) multi-stranded |
| Other: | 1.5 $mm^2$ (16 AWG) multi-stranded |

(UL/cUL Listed: Wire size: AWG 30-12. Use min. 60/75 °C copper conductors only)

| | |
|---|---|
| **Tightening torque:** | All inputs: 0.5 Nm (5-7 lb-in) |
| **PC connection:** | RS-232 converter box (option J5)<br>or USB interface cable (option J9) for service use |
| **Weight:** | 0.9 kg (1.9 lbs) |
| **Installation:** | **UL/cUL Listed:** To be installed in accordance with the NEC (US) or the CEC (Canada) |
| **Approval:** | CE<br>UL/cUL Listed to UL508 and CSA C. 22.2 no. 14-05<br>UL/cUL Recognized to UL2200 |

**Additional operator panel AOP-2**

| | |
|---|---|
| Operating temperature: | -20 to 70 ˚C (-4 to 158 ˚F)<br>(UL/cUL Listed: Max. 60 ˚C ambient) |
| Storage temperature: | -40 to 70 ˚C (-40 to158 ˚F) |
| Aux supply: | 18 to 36 V DC by external DC/DC converter 12DCR24/5<br>(UL/cUL Listed: 12DCR24/5 supplied from controlled Class 2 source) |
| Wiring: | Size: AWG 30-12<br>Use min. 60/75 ˚C copper conductors only |
| Tightening torque: | 0.5 Nm (4.4 lb-in) |
| Mounting: | Panel mounted<br>(UL/cUL Listed: For use on a flat surface of type 1 enclosure |
| Installation: | UL/cUL Listed: To be installed in acc. with the NEC (US) or the CEC (Canada) |
| Approval: | CE<br>UL Listed to UL508 and CSA C22.2 No. 142-M1987<br>UL Recognized to UL2200 |

# 5. Push-buttons, LEDs and display

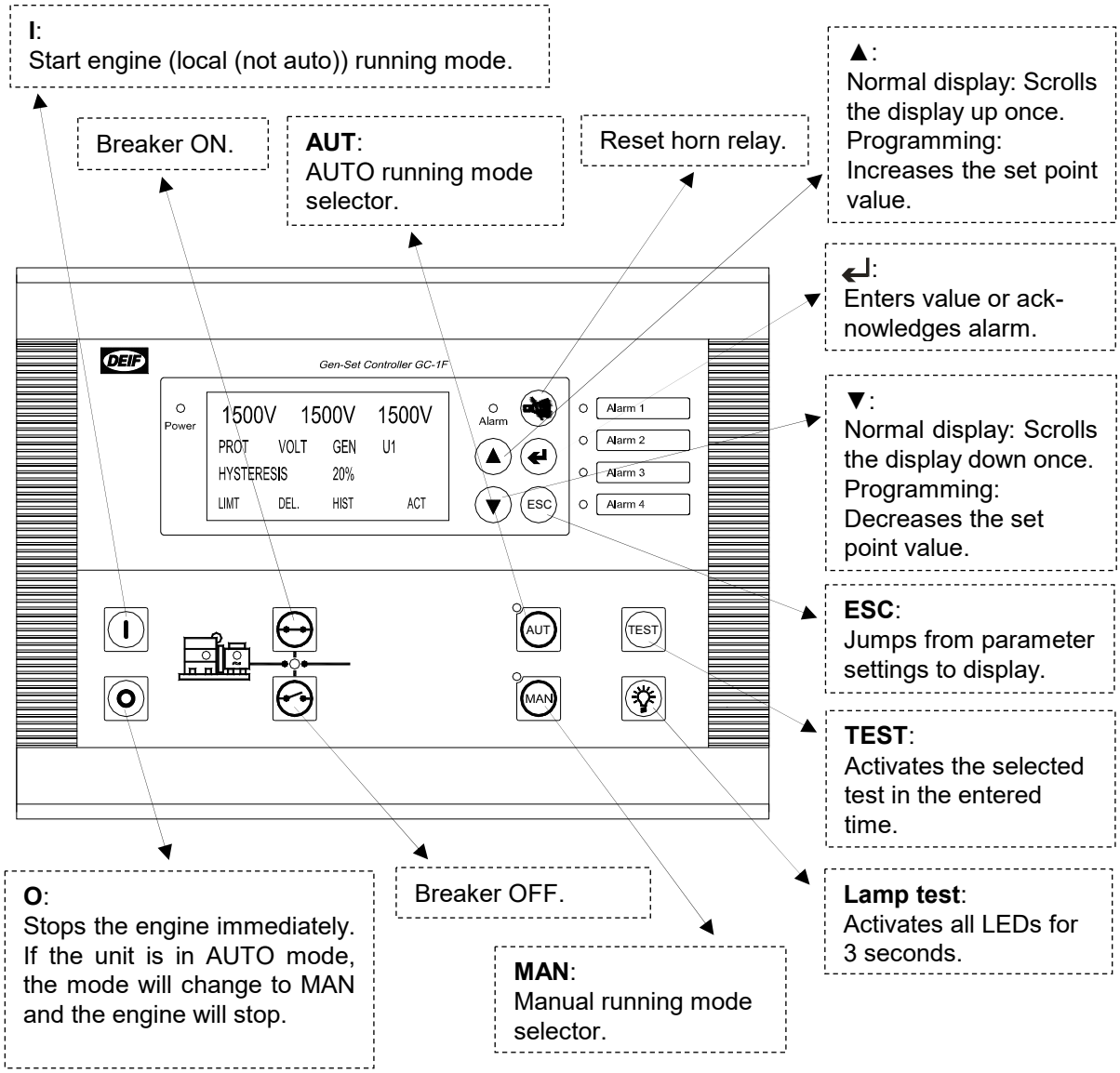
This chapter deals with the display including the push-button and LED functions.

## Unit

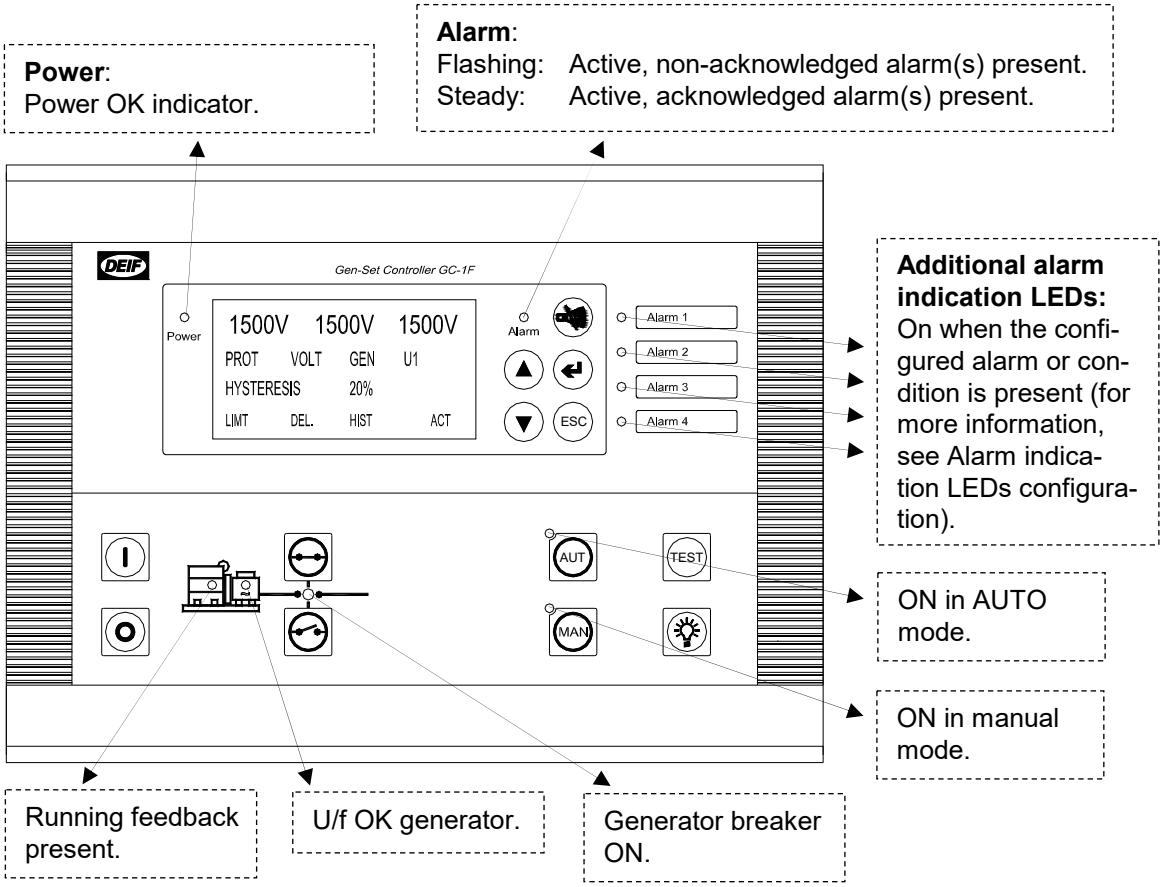
| | |
|---|---|
| **Front dimensions H × W** | 160 × 220 mm (6.30” × 8.66”) |
| **Unit depth** | 54 mm (2.13 “) |

### Push-button functions

The push-buttons on the unit have the following functions:



## LED functions




**Power**: Power OK indicator.

**Alarm**: Flashing (red): Active, non-acknowledged alarm(s) present (factory setting).
Steady (red): Active, acknowledged alarm(s) present (factory setting).

The alarm LED can also be adjusted to:

Flashing (red): Active, non-acknowledged shutdown alarm(s) present.
Steady (red): Active, acknowledged shutdown alarm(s) present.
Flashing (amber): Active trip stop alarm, trip GB alarm or warning non-acknowledged alarm(s) present.
Steady (amber): Active trip stop alarm, trip GB alarm or warning acknowledged alarm(s) present.

**This is adjusted in parameter 6940.**

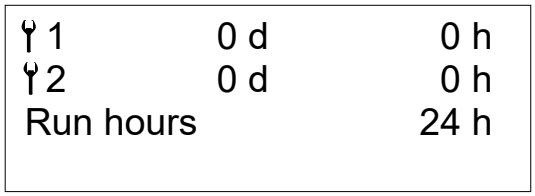
**Additional alarm indication LEDs**: Flashing or steady light in the colour configured in M-Logic when the defined logic line(s) is (are) true.

**Display functions**

The display indicates both readings and alarms. Illustrated below are examples with icons and English language.


Type, hardware and software version.

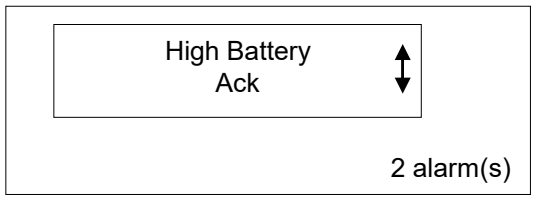

Fuel level, oil pressure, water temp. and RPM.



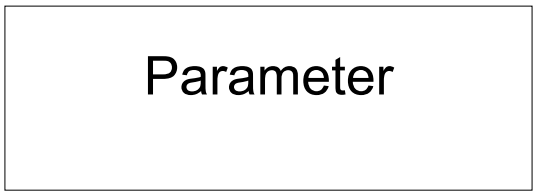

Service timer 1 and 2.

Run hours.

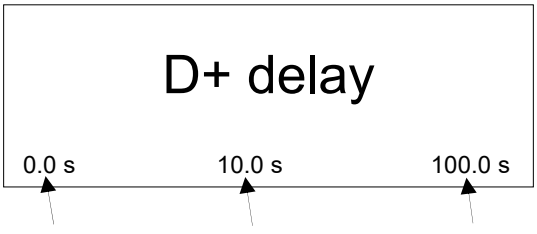

Press ↵ to enter the list of active alarms.




**Active alarm list**. The alarm list pops up automatically, when an alarm appears. When the arrow is present, more alarms are active. Press ▼ to scroll through the list. Exit the list by pressing ESC.




Press ↵ to enter the parameter setting.




Parameter example: D+ delay setting. Use ▲ or ▼ to scroll through the settings list. If change of settings is necessary, press ↵ and enter the password. Then use ▲ or ▼ to change values. Use ESC to leave settings.

**The available parameters depend on the set options. Some parameters can only be changed using the PC utility software (USW) for GC-1F. The parameter list will automatically be abandoned, if no button is pressed during a 30 s period.**

# 6. Functional descriptions

This chapter includes functional descriptions for the unit's standard functions. Screen dumps and flow charts are used in order to simplify the information.

## Alarm function

The unit will detect and display individual alarms which are enabled. Furthermore, it is possible to activate relays for alarm purposes. The alarms can be configured to any of the available relay outputs. Each alarm function has two output settings, namely output A and output B.

Alarms can be acknowledged in one of two ways: Either the binary input "alarm ack." (selectable to be one of the binary inputs 10, 11, 12, 13, 14 and 15) is used, if this is configured for alarm acknowledge, or the select button on the display is used:

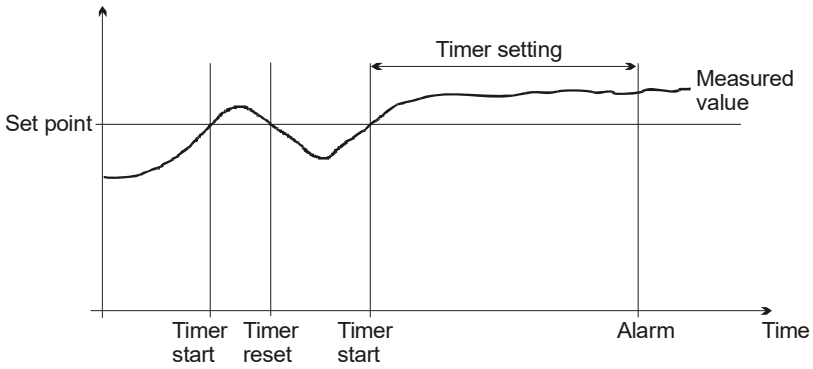
- The alarm acknowledge input acknowledges all present alarms, and the alarm LED will change from flashing to steady light.
- The display can be used in the alarm information window. The alarm information window displays one alarm at a time and the alarm state whether the alarm is acknowledged or not. If it is unacknowledged, then press ↵ to acknowledge it. Use the ▲ and ▼push-buttons to scroll in the alarm list.
- Shortcut to alarm list: press and hold 

The alarm LED will be flashing, if unacknowledged alarms are present. The alarm relay will deactivate, when the alarm situation is reset and the alarm is acknowledged.

## Timer function

The delay settings are all of the definite time type, that is a set point and time is selected.

If the function is for example overspeeding, the timer will be activated if the set point is exceeded. If the RPM value goes below the set point value before the timer runs out, then the timer will be stopped and reset.




When the timer runs out and the alarm is present, the output is activated.

## Mains voltage unbalance detection

The formula for mains voltage unbalance is:

(Most deviating line-to-line voltage - average voltage)*100/average voltage (nominal value in %)

## Phase sequence error

Prior to closing a breaker, the unit checks that the phase sequence is correct, depending on the chosen phase direction in parameter 2280: “phase rotation”. If it is incorrect (reversed), an alarm will be issued and the breaker in question (generator or option B3 mains breaker) will not be closed and the breaker’s LED will flash red.

## Utility software input configuration

It is possible to configure the inputs indicated in the table. The unit has a number of passive binary inputs (input terminals 10 to 15).

| Input function | Comment |
|---|---|
| Alarm acknowledge | Configurable |
| Start enable (OFF = start blocked) | Configurable |
| Remote start/stop | Configurable |
| Access lock | Configurable |
| Remote manual/auto | Configurable |
| Fire pump (shutdown override) | Configurable |
| D+ (digital running feedback) | Configurable |
| Idle speed | Configurable |
| Test sequence | Configurable |
| GB Pos on | Configurable (option G6) |
| GB Pos off | Configurable (option G6) |
| Digital inputs no. 1 to 6 used as alarms | Configurable |
| Inhibit EI alarms | Configurable |
| Remote Start (pulse) | Configurable |
| Remote Stop (pulse) | Configurable |
| Remote Start and close (pulse) | Configurable |
| Remote Open and stop (pulse) | Configurable |
| EIC increase speed | Configurable |
| EIC decrease speed | Configurable |
| Remote GB open | Configurable |
| Remote GB close | Configurable |
| Island mode | Configurable |
| GB close inhibit | Configurable |

### Input function description

*1. Alarm acknowledge*

Acknowledges all present alarms.

*2. Start enable*

This input must be activated to start the engine.

*3. Remote start/stop input*

Activating this input will start the genset. Deactivating it will stop the genset after cool down (auto mode only).

*4. Access lock*

Activating the access lock input deactivates the control push-buttons on the display and the possibility to change parameters. It will be possible to view measurements, alarms and the log.

*5.* Remote manual/auto
Selection between manual and auto running. The mode is changed every time the input is activated (pulse input).

*6. Shutdown override (fire pump)*
Deactivates all protection functions except overspeed and emergency stop protection.

*7. D+ (digital running feedback)*
This input is used as a running indication of the engine. When the input is activated, the start relay is deactivated. Input for running feedback from charge generator +D terminal. (Runs when charger U > battery voltage).

*8. Idle speed*
Activating the idle speed input holds the engine at idle speed as long as it is set.

*9. Test sequence*
When the test input is activated, the selected test sequence will start. See the test function description for further information.

*10. GB Pos on*
When this input is activated, the GC-1F sees the generator breaker as closed. If the GB and the off feedback are on or off simultaneously, a GB position failure is displayed.

*11. GB Pos off*
When this input is activated, the GC-1F sees the generator breaker as open. If the GB and the off feedback are on or off simultaneously, a GB position failure is displayed.

*12. Digital inputs 1 to 6*
These inputs are configurable as alarm inputs.

*13. Inhibit EI alarms*
When this input is active, it will inhibit all engine interface (option H5) alarms.

*14. Remote start (pulse)*
Start of engine.

*15. Remote stop (pulse)*
Stop of engine.

*16. Remote Start and close (pulse)*
Start of engine and GB close command.

*17. Remote Open and stop (pulse)*
Stop of engine and GB open command.

*18. EIC increase speed*
Manual regulation of engine speed (requires option H5)

*19. EIC decrease speed*
Manual regulation of engine speed (requires option H5)

*20. Remote GB open*
Ext. Trip of GB (pulse signal)

*21. Remote GB close*
Ext. Close of GB (pulse signal)

*22. Island mode*

Change genset mode to “Island”

*23. GB close inhibit*

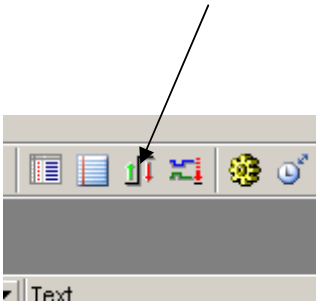
Inhibit used for GB, where ext. PLC or other equipment controls when load is on genset.

**If nominal setting is going to be selected by a binary input, M-Logic must be used.**

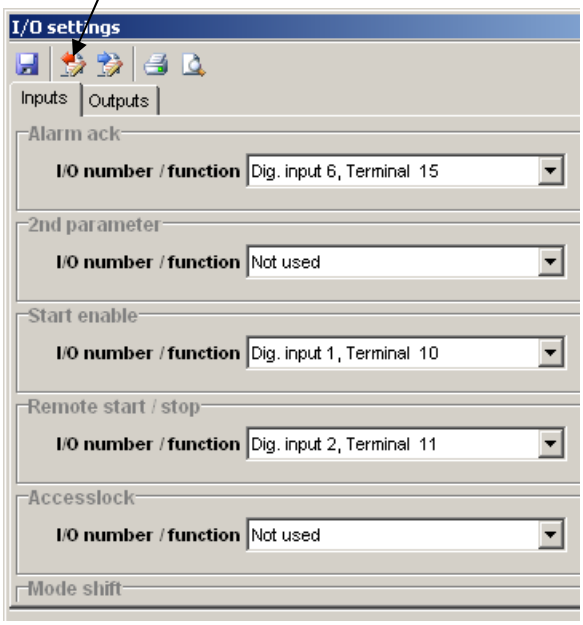
### Configuration of the digital alarm inputs

The digital inputs are configured via the utility software (USW).

Use this button to upload the menu.

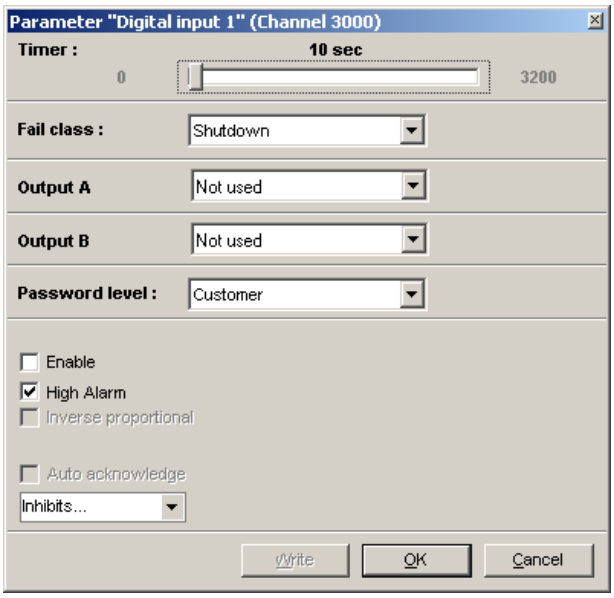



Remember to write the settings to the unit.



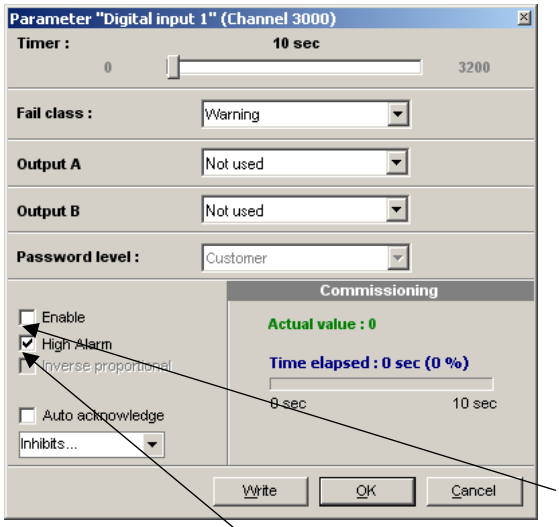

The individual I/O number and the function are now selected. In the example below, ‘*Digital input 1*’ is chosen and a terminal number must be assigned to the input. If the input is used as alarm input, then the name can be changed to the relevant name selected from the pre-defined list below.

**3000-3050 Digital input term. 10 to 15, without wire break detection**




Then name the input. This can be done in translation.

Complete the input settings and select the appropriate fail class and outputs. The outputs A and B can be used to activate one or two of the configurable relay outputs or LEDs. If the relay function is set as a limit relay, no warning pop-up will be shown in the display. The relay 0 is a virtual relay, so both output A and B must be set to limit relays if no warning in the display is wanted.




Remember to activate the function by marking the Enable tick box.

If the alarm is only to be active when the genset is running, the inhibit settings must be used. If for example “Not run status” is ticked in the inhibit settings, it means that the alarm is inhibited until the running feedback is present, when the Run status timer has not yet expired.

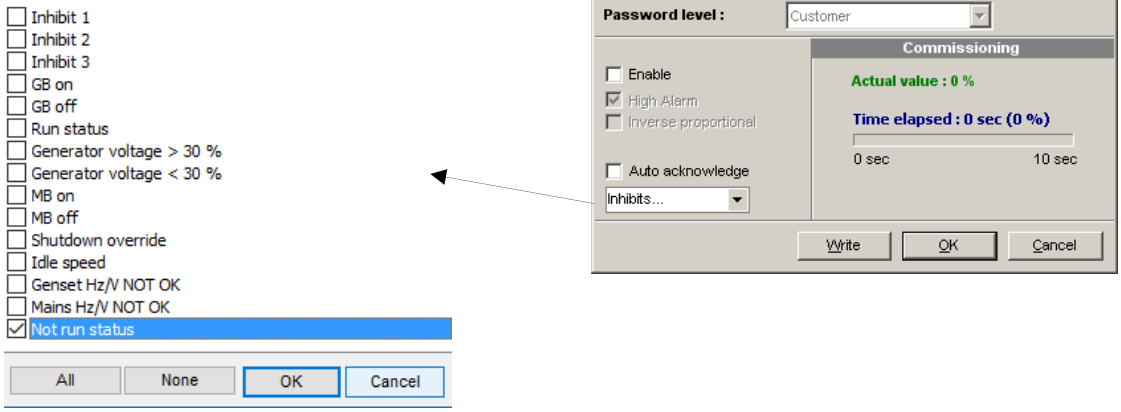
If the High Alarm is set, the alarm will be registered upon a closing contact. If the High Alarm is not set, the alarm will be registered upon an opening contact.

## Auto acknowledge and alarm inhibit

Auto acknowledge
Alarms are auto-acknowledged when the alarm becomes inactive.

Inhibit
In order to select when the alarms are to be active, a configurable inhibit setting for every alarm can be made. The inhibit functionality is only available via the PC utility software. Most of the alarms have a drop-down window where it is possible to select which signals that have to be present in order to inhibit the alarm.

In this example, inhibit is set to Not run status. Here, the alarm will only be active when the generator has started and running feedback is present.




| Function | Description |
|---|---|
| Inhibit 1 | M-Logic outputs: Conditions are programmed in M-Logic |
| Inhibit 2 | |
| Inhibit 3 | |
| GB ON (TB ON) | The generator breaker is closed |
| GB OFF (TB ON) | The generator breaker is open |
| Run status | Running detected and the timer in menu 6160 expired |
| Not run status | Running not detected or the timer in menu 6160 not expired |
| Generator voltage > 30 % | Generator voltage is above 30 % of nominal |
| Generator voltage < 30 % | Generator voltage is below 30 % of nominal |
| MB ON | The mains breaker is closed |
| MB OFF | The mains breaker is open |
| Idle speed | Idle speed depends of the engine manufacture |
| Shutdown override | Inhibit if Shutdown override input is active |
| Genset, CB1 Hz/V NOT OK | If voltage and frequency are NOT within range |
| Mains, CB2 Hz/V NOT OK | If voltage and frequency are NOT within range |

**If an alarm is configured to activate a limit relay, the relay will activate despite the fact that the inhibit input is ON.**

**Remember to press the "Refresh I/O texts" button after any changes made.**

## Output functions

It is possible to configure the output functions indicated in the table. The unit has seven configurable relay outputs (output terminals 20 to 27 and 45 to 48).

| Output function | Factory setting |
|---|---|
| Run coil | Relay 23 |
| Stop coil | |
| Prepare | Relay 21 |
| Starter | Relay 22 |
| Engine run indication | |
| Idle speed output | |
| Horn | Relay 24 |
| Alarm/limit | Relay 26 |
| Fuel pump | |
| Engine heater | |
| Stop coil (not acc. in start seq.) | |
| Generator breaker (continuous) | Relay 45 |
| GB ON pulse | |
| GB OFF pulse | |
| Manual mode | |
| Auto mode | |
| Test mode | |
| Off mode | |
| GB status | |

**Relays 21/22/23 cannot be configured as MB or GB.**

**Relay 47 is closed when deenergised, but works as all other relays when GC-1F is powered up.**

### Output function description

*1. Run coil*
The relay configured to Run coil will be closed the entire time the engine is supposed to run.

*2. Stop coil*
This relay will close to stop the engine, and when no running feedback is present it will stay closed in the ext. stop time (parameter 6212).

*3. Prepare*
This function will close the relay as the first thing in the start sequence. The relay will be closed for the time programmed in parameter 6181. This function is used for pre-heating the engine or for pre-lubrication.

*4. Starter*
The relay configured to Starter will be closed for the time selected in parameter 6184 in the start sequence of the GC-1F.

*5. Engine run indication*
If a relay is configured to this function, this relay will close when a running feedback is detected. The relay will open again when the engine stops.

*6. Idle speed output*
This relay will close to give the engine governor the idle command (low speed).

7. *Horn*
   The horn relay is a common alarm output. This means that every time an alarm state appears, the horn relay will close for the time configured in the parameter 6130 Alarm horn regardless of fail class. If 6130 is set to 0 seconds, it will be on until the reset horn push-button is activated or the alarm(s) has (have) been acknowledged.

*8. Alarm/limit*
   When this setting for the relay is selected, the relay can be used in the alarm parameters in the setting Output A and Output B. This means that with factory settings, the relay 2 can be used in the parameters as an alarm relay. If the relay is preferred to be a Limit relay, this selection must be done in the parameter list parameter 5000 to 5060.

*9. Fuel pump*
   Output must be configured to use fuel pump settings.

*10. Engine heater*
   The relay configured to Engine heater will close when the temperature is below the set point in parameter 6320 and open again when the temperature is above the set point in parameter 6330. For more information, see the description of the function.

*11. Stop coil (not acc. in start seq.)*
   The relay configured to this function will do the same as the normal stop coil with one exception: It will not close between the start attempts.

*12. Generator breaker (continuous)*
   GB Relay contact will close continuously.

*13. GB ON (pulse)*
   GB relay contact will give an ON pulse signal.

*14. GC OFF (pulse)*
   GB relay contact will give an OFF pulse signal.

*15. Manual mode*
   Mode status signal.

*16. Auto mode*
   Mode status signal.

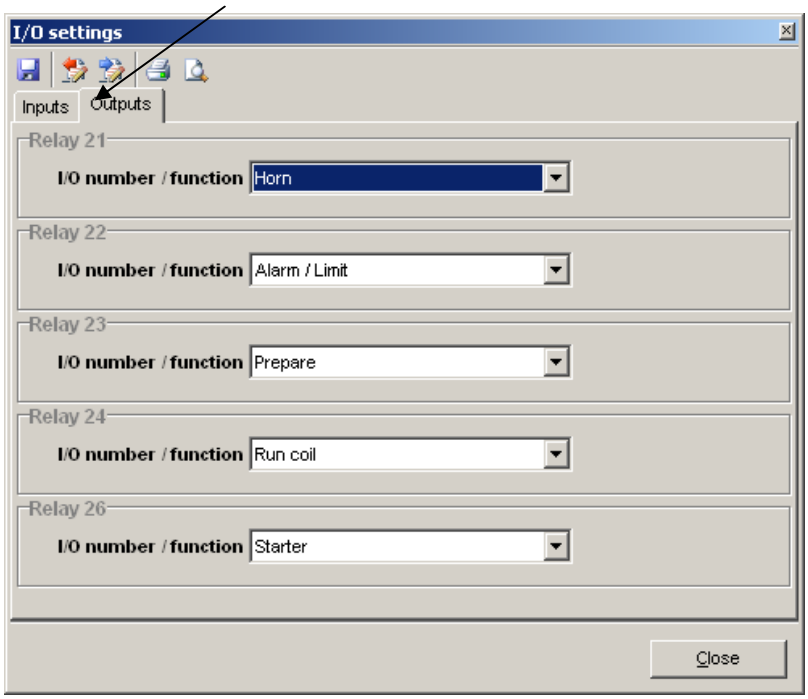
*17. Test mode*
   Mode status signal.

*18. Off mode*
   Mode status signal.

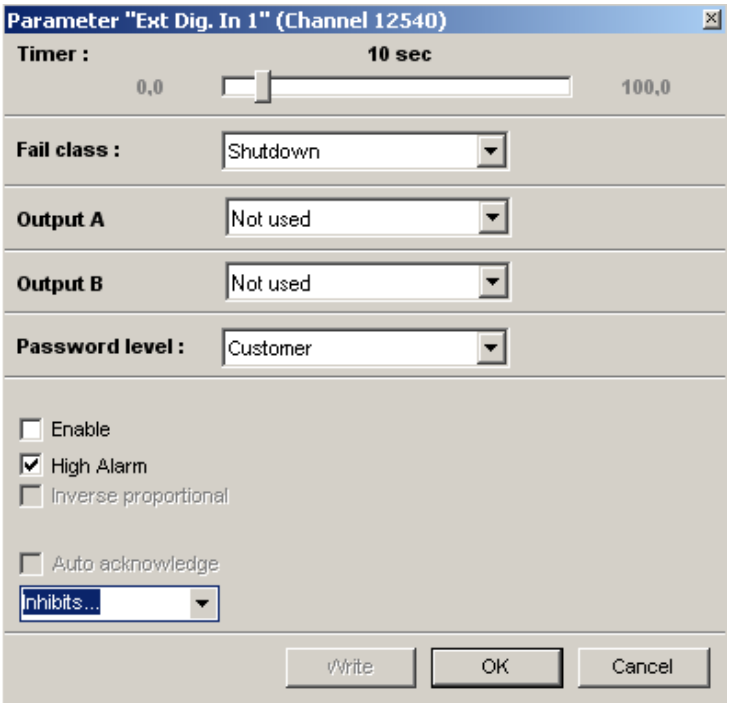
*19. GB status*
   Contact closed when GB is closed.

After configuration of the input parameter, it is possible to assign an output. Use the dialogue box below for configuration of the output relay.

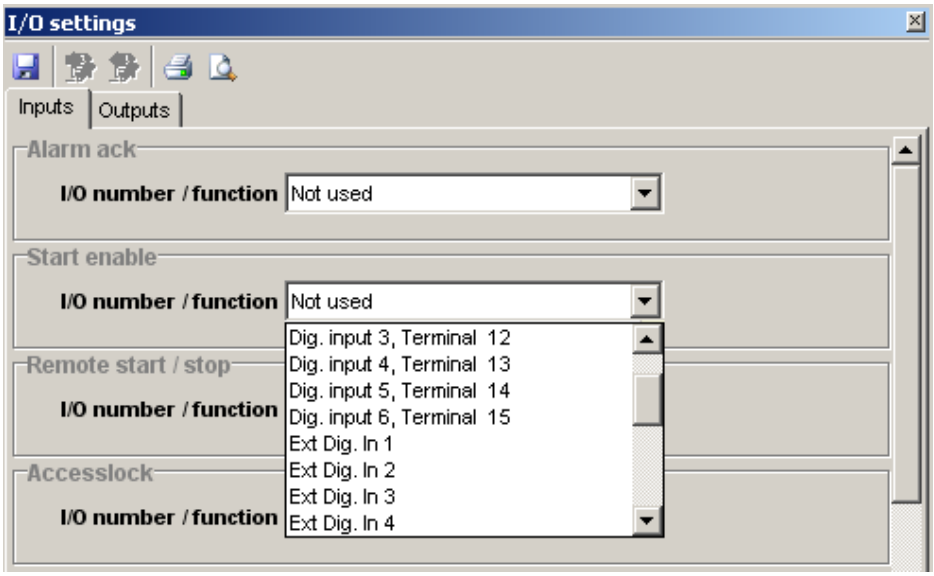
Remember to write the settings to the GC-1F before closing the dialogue box.



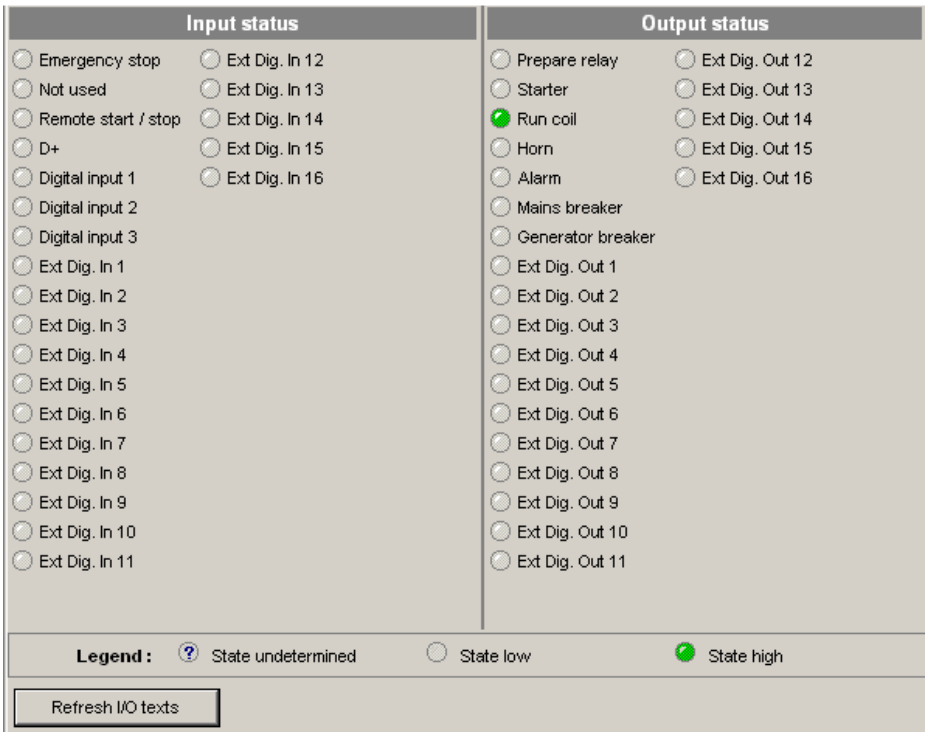
## Configuration of the external I/O (option H8)




External I/Os have the same popup window with parameter settings as the internal I/Os of the GC-1F.



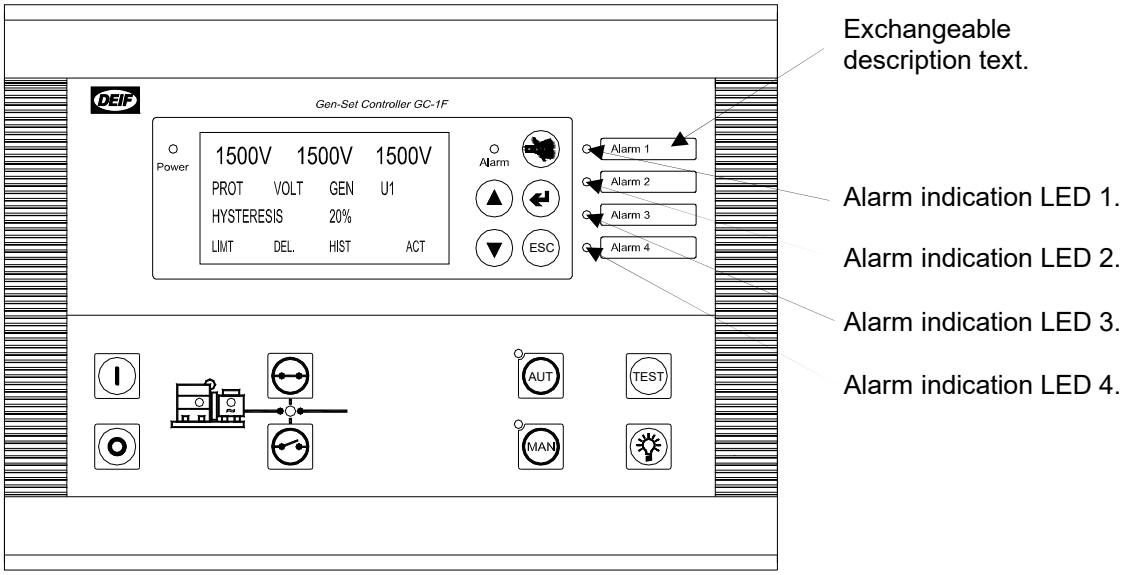

Programming of external I/Os is done in the same way as the built-in I/Os of the GC-1F, using the PC utility software (USW).




Only available external I/Os are listed in the Input/Output view. If for example one hardware module is removed, it will also be removed from the list above.

## Alarm indication LEDs

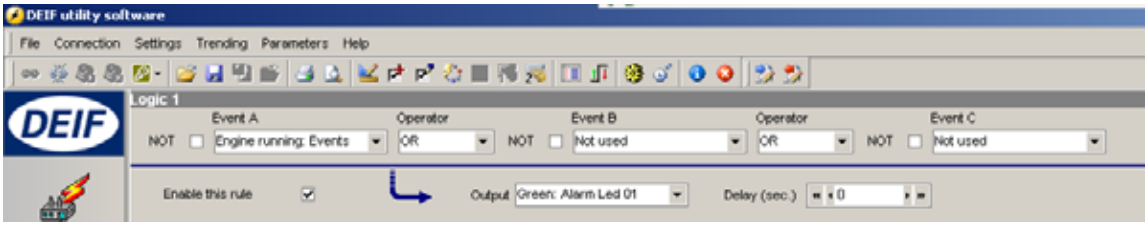
Alarm indication LEDs are the four LEDs placed in the right side of the front label on the GC-1F. In the clear window next to the LEDs a label can be placed to explain the function of the LEDs. No label is provided from the factory. The label can be written on an overhead projector sheet and can be used with the print template on the cd.



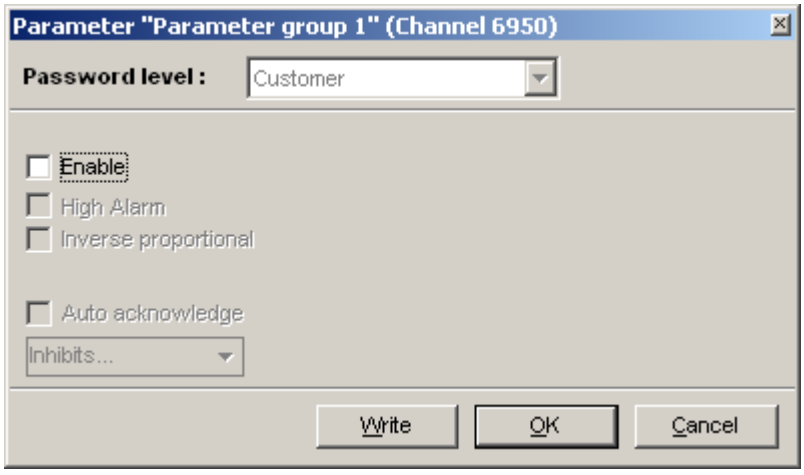

### Configuration of the alarm indication LEDs

The configuration of alarm indication LEDs is done from M-Logic. This means the LEDs can have three different colours, that is red, green or red flashing or steady light. The LEDs can be activated in all parameters output A + B and are also available in M-Logic.

In the screen dump, the alarm LED 1 is configured to be green when the engine is running.

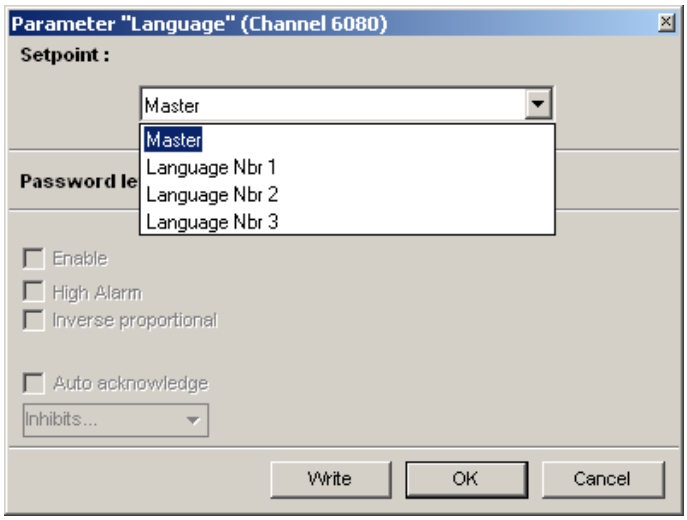


## Parameter groups




Parameters shown in the display are split up in a default parameter list and the rest into three groups. It is possible to select one or two of the groups or to select them all.

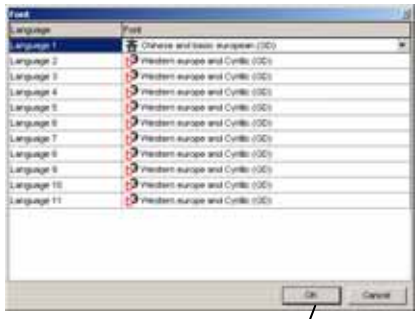
## Language selection




The unit has the possibility to display different languages. It is delivered with one master language which is English, furthermore three languages which are selected by the customer on the order specification. Furthermore, eight translations can be made by the customer, so a total of 11 languages can be saved in the unit by using the PC utility software. The used language can be changed when connected to the PC utility software. It is not possible to make language configuration from the display, but the already configured languages can be selected.

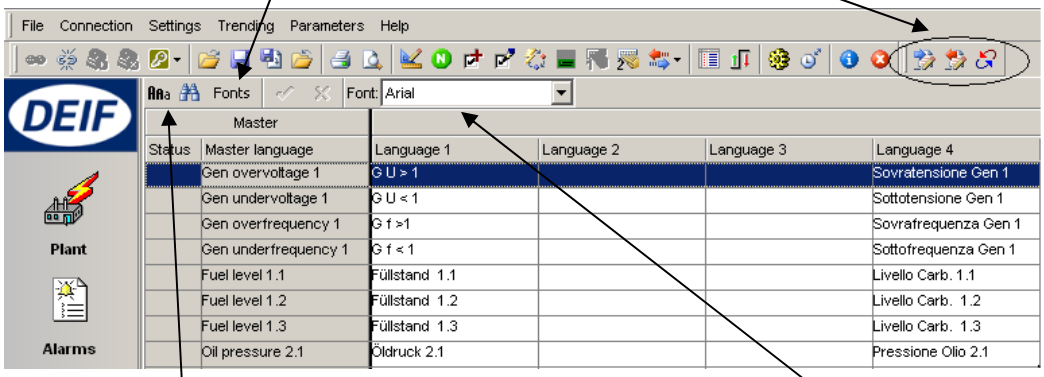
## Translation

Translation gives the customer the possibility to translate all texts that are shown in the display. Parameter texts used in the PC USW will only be shown in master language.

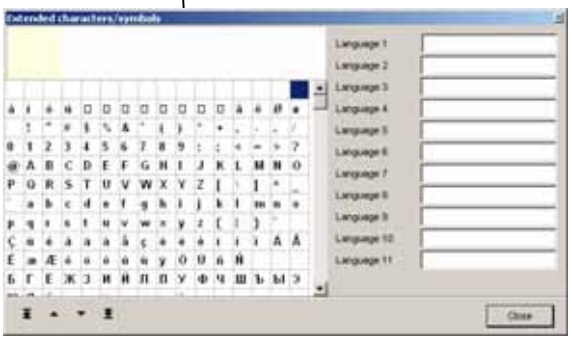


Setup for characters.

Icons used for upload/download of translation. Sync. icon used to synchronise between master language and customised language files done by customer.




Here it is possible to change between Arial and Arial Unicode MS fonts dependent on the country keyboard code.



Extended characters/symbols.

**Characters not supported by the GC-1F will be indicated by a question mark in the text field.**

## Fail class

All the activated alarms of the GC-1F must be configured with a fail class. The fail classes define the category of the alarms and the subsequent action of the alarm.

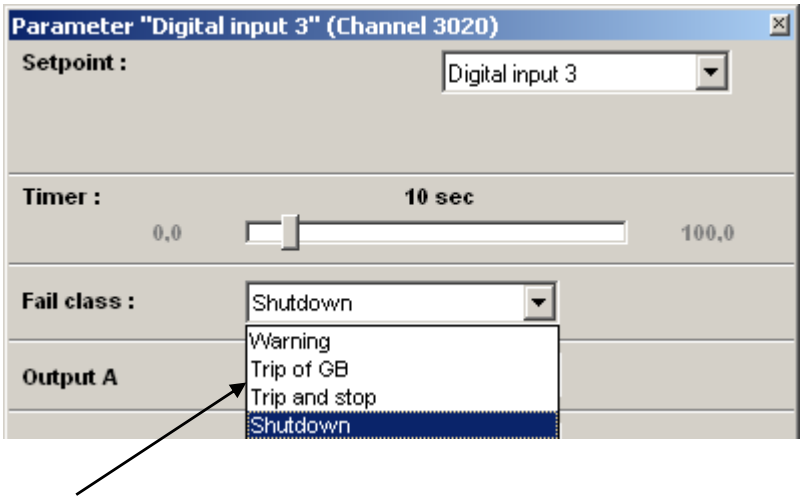
Four different fail classes are available:

| Fail class | Action | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Alarm horn relay* | Alarm display | Block en-gine start | Open gen. breaker | Open mains breaker | Stop gene-rator | Cool-down | Shut-down | Shut-down + Manual mode** |
| 0 Warning | X | X | | | | | | | |
| 1 Trip of GB | X | X | | X | | | | | |
| 2 Trip and stop | X | X | X | X | | X | X | | |
| 3 Shutdown | X | X | X | X | | X | | X | X |
| 4 Trip of MB | X | X | | | X | | | | |
| 5 Shutdown + manual mode | X | X | X | X | | X | | X | X |

** When alarm horn relay output is selected actively.

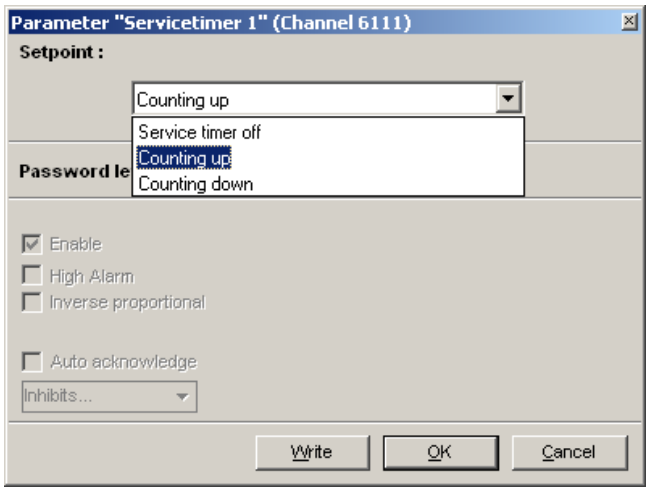
### Fail class configuration

The fail class can be selected for each alarm function via the USW (PC software). To change the fail class via the PC software, the alarm function to be configured must be selected. Select the desired fail class in the fail class roll down panel.




The fail class roll down panel is activated, and the individual functions are ready for selection.

## Service timers




The controller can monitor two different maintenance intervals:

- Service timer 1
- Service timer 2

The service timers both have the possibility of a setting for days (total elapsed time) and hours (running hours). The day setting counts whenever there is aux. supply on the GC-1F, and the hours count when a running feedback is present. It is possible to set the service timers to count up or count down.

The service timer alarm activates whenever the amount of days or the amount of running hours has expired. If the service timer is set to count up, the display will show 0 days or 0 hours; if the service timer is set to count down, the display will show the amount of days or hours programmed in the parameter list: 6112, 6113, 6122 and 6123.

When the service timer alarm appears, it can be acknowledged but the alarm will not become inactive before the service timer has been reset. This can be done from the display or via the utility software. Whenever the service timer is reset, the timer will start counting from the initial value.

## Counters

Counters for various values are included, and some of these can be adjusted if necessary, for instance if the unit is installed on an existing genset or a new circuit breaker has been installed. The table shows the adjustable values and their function in menu 6100: Description Function Comment.

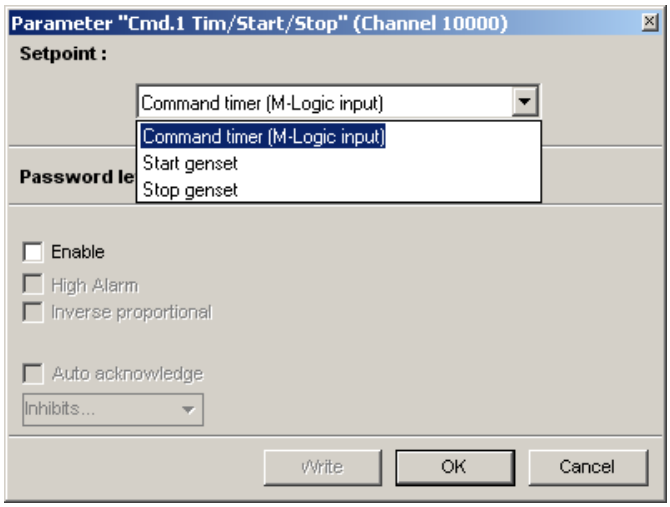
| Description | Function | Comment |
|---|---|---|
| 6101 Running time | Offset adjustment of the total running hours counter. | Counting when the running feedback is present. |
| 6103 GB operations | Offset adjustment of the number of generator breaker operations. | Counting at each GB close command. |
| 6105 kWh reset | Resets the kWh counter. | Automatically resets to OFF after the reset. The reset function cannot be left active. |

**The service timer alarm must be reset in the parameter list via the GC-1F display or via the utility software in parameter 6116 or 6126 to remove the actual alarm.**

## Command timer

The purpose of the command timer is to be able to start and stop the genset automatically at specific times each weekday or certain weekdays. Up to 8 commands can be used for either start or stop. The settings are set up through the PC utility software. Each command can be set for the following time periods:

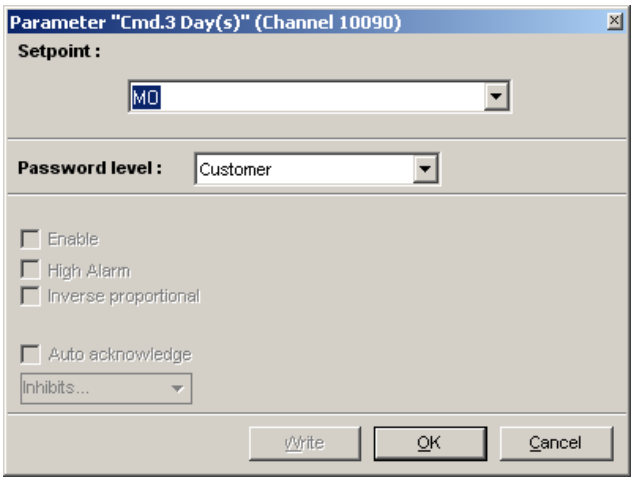
- Individual days (MO, TU, WE, TH, FR, SA, SU)
- MO, TU, WE, TH
- MO, TU, WE, TH, FR
- MO, TU, WE, TH, FR, SA, SU
- SA, SU



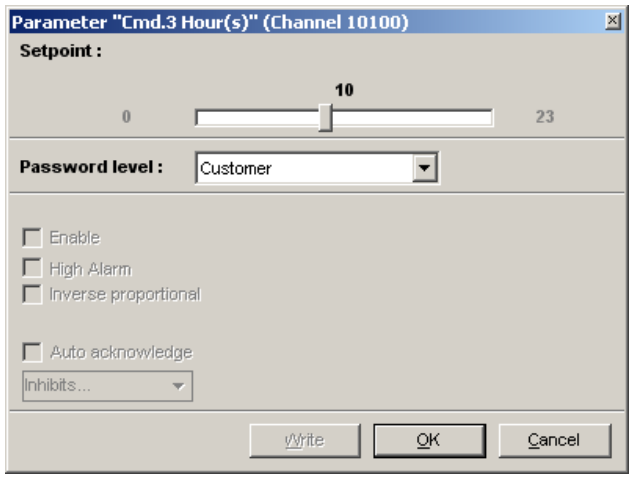

Select command timer function

**Command timers will only work in AUTO mode.**

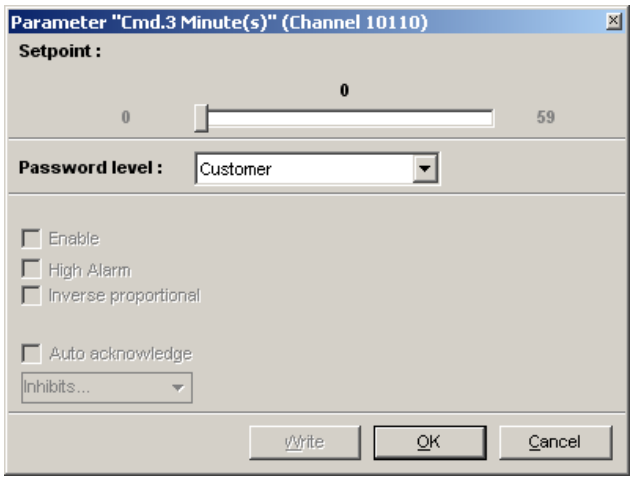
**“Start” and “Stop” genset will not work in AMF and ATS modes.**




Select day(s) command timer should be active




Hour setting




Minute setting

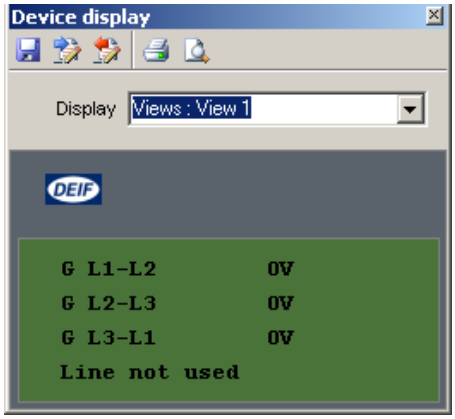
**The digital input "auto start/stop" cannot be used, when this function is enabled.**

**It is necessary to use the PC utility software when setting up command timers (settings 10000 to 10310).**

## Configurable views in the display

The views in the display are configurable, this gives the customers the opportunity to make their own views. There are up to 15 configurable views, which can all be set to 3 or 4 line views.

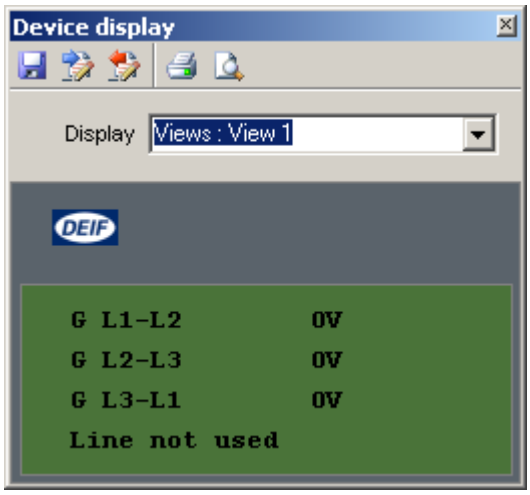
**3 line views can show a value of max. 9999.**

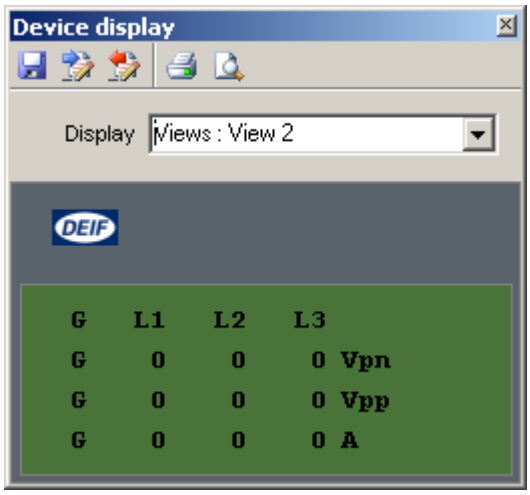


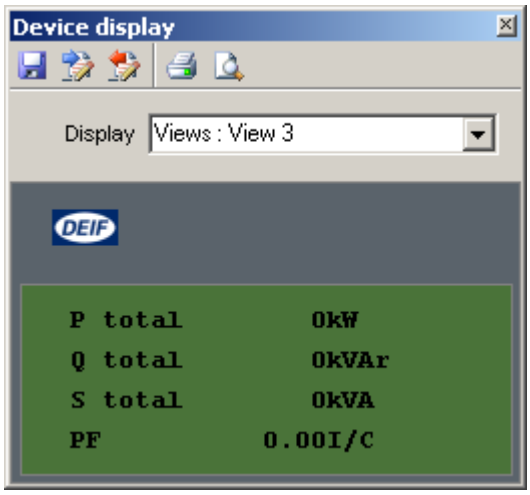

| Possible views | | |
|---|---|---|
| **Text in USW** | **View in display** | **Comment** |
| G L1-L2 | G L1-L2 XXX V | |
| G L2-L3 | G L2-L3 XXX V | |
| G L3-L1 | G L3-L1 XXX V | |
| G L1-N | G L1-N XXX V | |
| G L2-N | G L2-N XXX V | |
| G L3-N | G L3-N XXX V | |
| G I L1 | G I L1 XXX A | |
| G I L2 | G I L2 XXX A | |
| G I L3 | G I L3 XXX A | |
| G P L1 | G P L1 XXX kW | |
| G P L2 | G P L2 XXX kW | |
| G P L3 | G P L3 XXX kW | |
| G f L1 | G f L1 XX.X Hz | |
| G L1 L2 L3 | G L1 L2 L3 | Only in 4 line view |
| G UL1 UL2 UL3 | XXXX XXXX XXXX Vpn | Only in 4 line view |
| G UL12 UL23 UL32 | XXXX XXXX XXXX Vpp | Only in 4 line view |
| G IL1 IL2 IL3 | XXXX XXXX XXXX A | Only in 4 line view |
| G PL1 PL2 PL3 | XXXX XXXX XXXX kW | Only in 4 line view |
| | | |
| PF | PF X.XX | The unit can be either I or C for Inductive or Capacitive |
| P | P XXX kW | |
| Q | Q XXX kvar | |
| S | S XXX kVA | |
| E | E XXX kWh | |
| M L1-L2 | M L1-L2 XXX V | |
| M L2-L3 | M L2-L3 XXX V | |
| M L3-L1 | M L3-L1 XXX V | |
| M L1-N | M L1-N XXX V | |
| M L2-N | M L2-N XXX V | |
| M L3-N | M L3-N XXX V | |
| M L1 L2 L3 | M L1 L2 L3 | Only in 4 line view |
| M UL1 UL2 UL3 | XXXX XXXX XXXX Vpn | Only in 4 line view |
| M UL12 UL23 UL32 | XXXX XXXX XXXX Vpp | Only in 4 line view |
| | | |

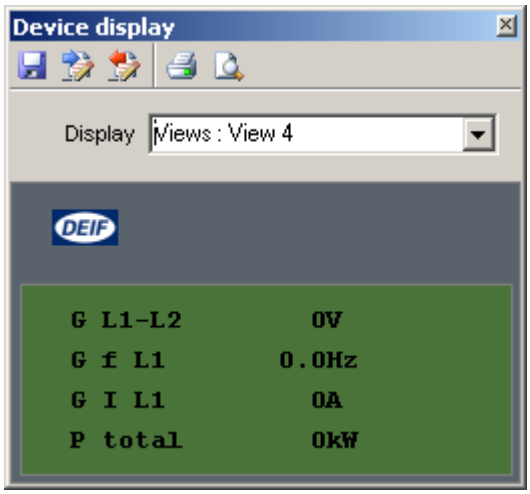
| | | |
|---|---|---|
| Multi-input 1 | Fuel level XXX % | |
| Multi-input 2 | Oil press XX.X bar | |
| Multi-input 3 | Water Temp XX ˚C | |
| Run hours | Run hours XXXXXh | |
| Fire pump hours | Fire pump XXXXXh | Counting when running feedback OK and shutdown override input is active |
| Battery | Battery XX.XV | |
| RPM | RPM XXXX | |
| Time and date | 10/01 2008 hh:mm:ss | |
| Service 1 | Service 1 0 d 0 h | |
| Service 2 | Service 2 41 d 16 h | |
| Empty line | | To make a view nice |
| EIC speed | RPM | |
| EIC T. Coolant | EIC T. Coolant | |
| EIC L. Coolant | EIC L. Coolant | |
| EIC P. Coolant | EIC P. Coolant | |
| EIC T. Oil | EIC T. Oil | |
| EIC L. Oil | EIC L. Oil | |
| EIC P. Oil | EIC P. Oil | |
| EIC T. Fuel | EIC T. Fuel | |
| EIC P. Fuel | EIC P. Fuel | |
| EIC T. Air Inl. | EIC T. Air Inl. | |
| EIC P. Air Inl. | EIC P. Air Inl. | |
| EIC P. Boost | EIC P. Boost | |
| EIC Faults | EIC Faults | |
| EIC Fuel Rate | EIC Fuel Rate | |
| EIC P. Charge Air | EIC P. Charge Air | |
| EIC T. Charge Air | EIC T. Charge Air | |
| EIC DDETorque | EIC DDETorque | |
| EIC ACTorque | EIC ACTorque | |
| EIC PosAcc | EIC PosAcc | |
| EIC Load speed | EIC Load speed | |
| EIC T. Ex. Gas | EIC T. Ex. Gas | |
| EIC engine run hours | EIC engine run hours | |
| EIC P. Fi. Oil | EIC P. Fi. Oil | |
| EIC Battery | EIC Battery | |
| EIC P. Crank | EIC P. Crank | |
| EIC Water In Fuel | EIC Water In Fuel | |
| EIC Blowby Flow | EIC Blowby Flow | |
| EIC P. Fuel R. | EIC P. Fuel R. | |
| EIC P. Timing | EIC P. Timing | |
| EIC T. Afterc. W. | EIC T. Afterc. W. | |
| EIC T. Turbo Oil | EIC T. Turbo Oil | |
| EIC P. Trap Inlet | EIC P. Trap Inlet | |
| EIC P. Air in diff | EIC P. Air in diff | |
| EIC P. Cool diff | EIC P. Cool diff | |
| EIC P. Barometric | EIC P. Barometric | |
| EIC T. Ambient Air | EIC T. Ambient Air | |
| EIC T. Exh. Right | EIC T. Exh. Right | |
| EIC T. Exh. Left | EIC T. Exh. Left | |
| EIC T. Winding 1 | EIC T. Winding 1 | |
| EIC T. Winding 2 | EIC T. Winding 2 | |
| EIC T. Winding 3 | EIC T. Winding 3 | |
| EIC P. Aux 1 | EIC P. Aux 1 | |
| EIC P. Aux 2 | EIC P. Aux 2 | |
| EIC T. Turbo | EIC T. Turbo | |
| EIC T. Intercooler | EIC T. Intercooler | |

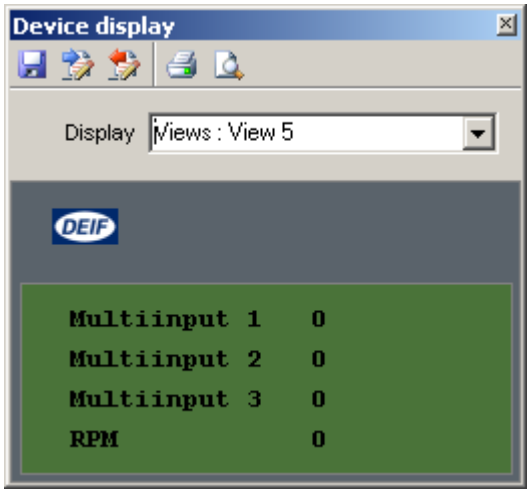
## Factory default views

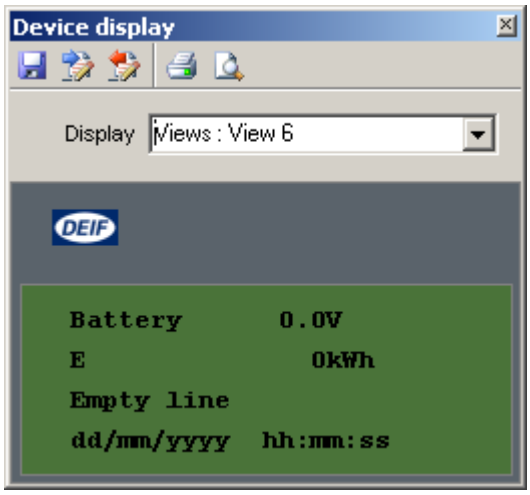


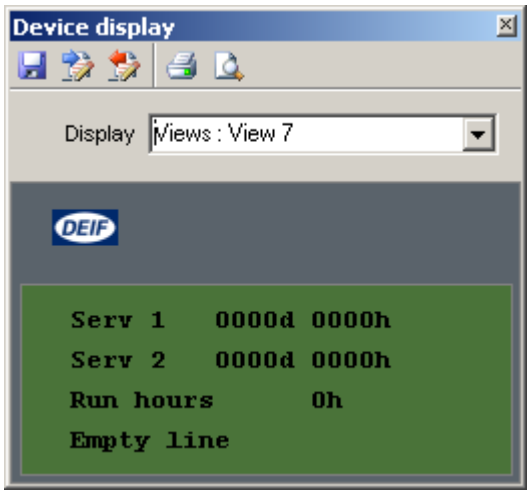



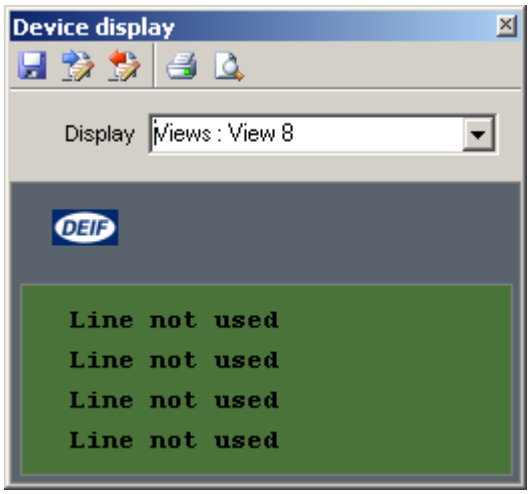



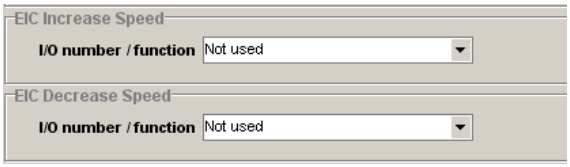


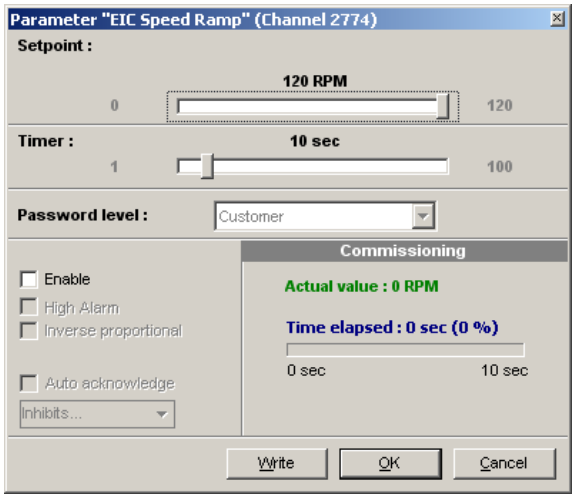

8-15 display views are empty

## EIC Speed Ramp (requires option H5)

Manual speed ramp up/down regulation via CAN engine communication, can be done by using two digital inputs.




The speed ramp up/down can be adjusted in menu 2774. The regulation span is +/- 120 RPM.



## RMI sensors

**RMI sensors are noise sensitive, therefore we recommend to use 2-wire sensors.**

There are three RMI inputs in the unit. The inputs have different functions due to the fact that the hardware design is able to cover several RMI types.

**All RMI inputs have a general accuracy of 2 %.**

RMI input 2: Oil pressure - max. 240 Ohm
RMI input 3: Cooling water temperature - max. 2500 Ohm
RMI input 1: Fuel level sensor - max. 180 Ohm

**HW 1.05 and SW 2x.x have max. 2500 Ohm of all RMI sensors.**

**RMI input 1, fuel level**

| | RMI sensor type |
|---|---|
| | Type 1 |
| Value | Resistance |
| 0 % | 78.8 Ω |
| 100 % | 1.6 Ω |

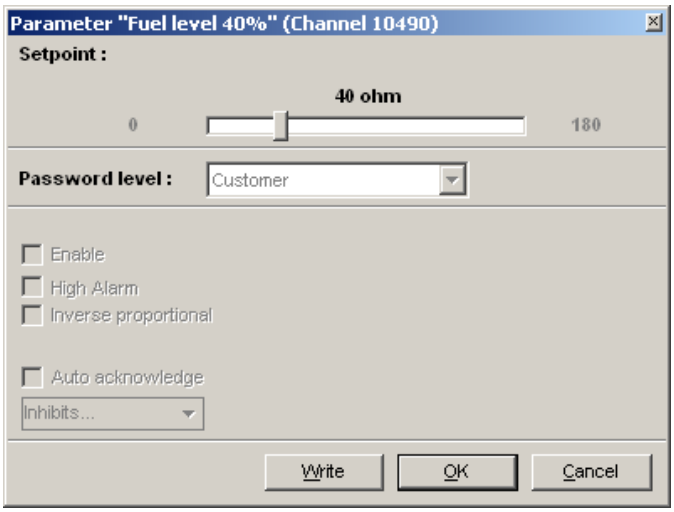
| | RMI sensor type |
|---|---|
| | Type 2 |
| Value | Resistance |
| 0 % | 3 Ω |
| 100 % | 180 Ω |

**RMI input 1, fuel level: type 1 and 2 curves are linear.**

| | RMI sensor type |
|---|---|
| Value | Type 3 |
| % | Resistance |
| 0 | Configurable |
| 10 | |
| 20 | |
| 30 | |
| 40 | |
| 50 | |
| 60 | |
| 70 | |
| 80 | |
| 90 | |
| 100 | |

**Type 3 is fully configurable with eight points in the input range 0 to 180 Ω and 0 to 100 %.**

The PC utility software setting looks like this:



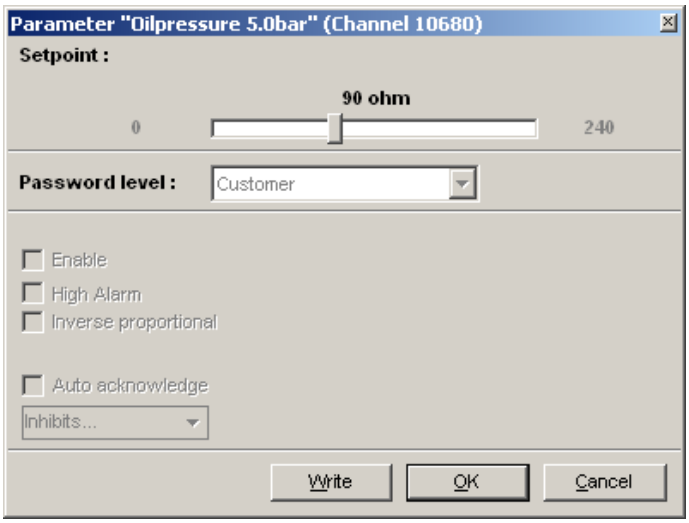

**Eight settings are available from 0 to 150 %.**

**RMI input 2, oil pressure**

| | | RMI sensor type | | | |
|---|---|---|---|---|---|
| **Pressure** | | **Type 1** | **Type 2** | **Type 3** | **Type 4** |
| **Bar** | **Psi** | **Ω** | **Ω** | **Ω** | **Ω** |
| 0 | 0 | 10.0 | 10.0 | | Configurable |
| 0.5 | 7 | 27.2 | | | |
| 1.0 | 15 | 44.9 | | 195.6 | |
| 1.5 | 22 | 62.9 | | | |
| 2.0 | 29 | 81.0 | 51.5 | 162.2 | |
| 2.5 | 36 | 99.2 | | | |
| 3.0 | 44 | 117.1 | 71.0 | 135.7 | |
| 3.5 | 51 | 134.7 | | | |
| 4.0 | 58 | 151.9 | 89.6 | 116.6 | |
| 4.5 | 65 | 168.3 | | | |
| 5.0 | 73 | 184.0 | 107.3 | 98.0 | |
| 6.0 | 87 | | 124.3 | 78.9 | |
| 7.0 | 102 | | | 68.8 | |
| 8.0 | 116 | | 155.7 | 57.2 | |
| 9.0 | 131 | | | 47.7 | |
| 10.0 | 145 | | 184.0 | 40.0 | |

**Type 4 is fully configurable with eight points in the range 0 to 240 Ω and 0 to 10.0 bar. The parameter settings can be found from menu 10810.**

The PC utility software setting looks like this:



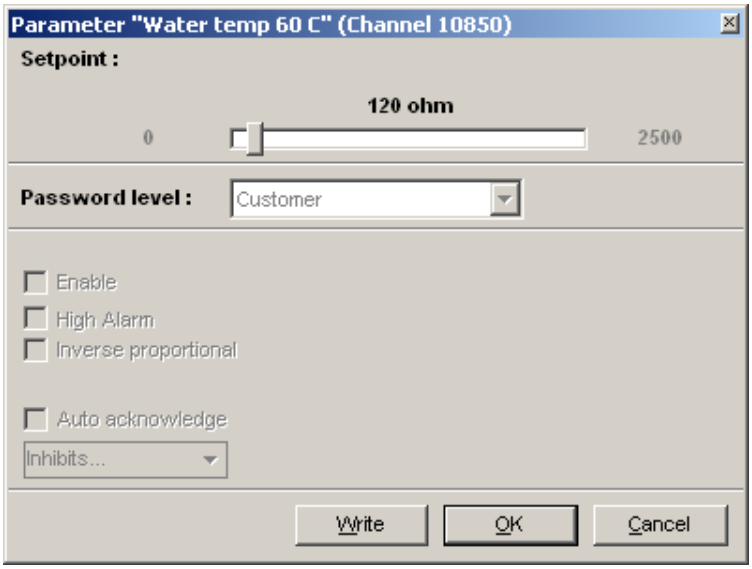

**Eight settings are available from 0 to 10 bar.**

**RMI input 3, cooling water temperature**

| | | RMI sensor type | | | | |
|---|---|---|---|---|---|---|
| Temperature | | Type 1 | Type 2 | Type 3 | Type 4 | Type 5 |
| °C | °F | Ω | Ω | Ω | Ω | Ω |
| 40 | 104 | 291.5 | 480.7 | 69.3 | 952 | Configurable |
| 50 | 122 | | | | 622 | |
| 60 | 140 | 134.0 | 222.5 | 36.0 | 426 | |
| 70 | 158 | 97.1 | | 27.9 | 290 | |
| 80 | 176 | 70.1 | 113.2 | 19.8 | 197 | |
| 90 | 184 | 51.2 | 83.2 | 15.8 | 147 | |
| 100 | 212 | 38.5 | 62.4 | 11.7 | 106 | |
| 110 | 230 | 29.1 | 47.6 | 9.5 | 90 | |
| 120 | 248 | 22.4 | | 7.4 | 76 | |
| 130 | 266 | | 28.9 | | 65 | |
| 140 | 284 | | | | 55 | |
| 150 | 302 | | 18.2 | | 46 | |

**Type 4 is fully configurable with eight points in the range 0 to 2500 Ω and 40 to 150 °C or 104 to 302 °F.**

The PC utility software setting looks like this:




**Eight settings are available from 0 to 150 ° or 104 to 302 °F.**

**RMI usage**

The RMI inputs are used as alarm inputs and can be configured in the following menus.

RMI input 2: Lubricating oil pressure - alarm settings in menus:

**4310 RMI oil press. input 2.1**
**4320 RMI oil press. input 2.2**

RMI input 3: Cooling water temperature - alarm settings in menus:

**4460 RMI water temp. input 3.1**
**4470 RMI water temp. input 3.2**

**4630 RMI low w. temp. input 3.3**

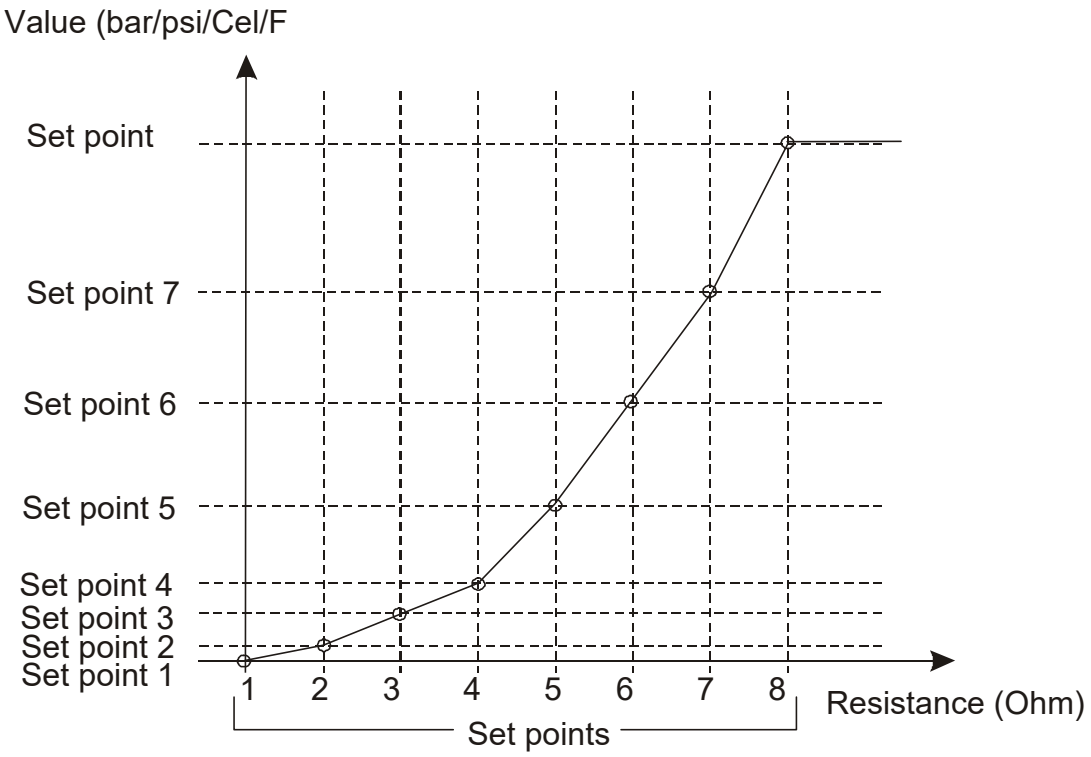
RMI input 1: Fuel level - alarm settings in menus:

**4220 RMI fuel level input 1.1**
**4230 RMI fuel level input 1.2**

**4620 RMI fuel level input 1.3**

In addition, RMI input 1 is also used for the fuel logic function.

**Illustration of configurable inputs**




**All Y and X axis values can be adjusted in the entire range.**

**Configuration**

The eight curve settings for the configurable RMI inputs cannot be changed in the display, but **only** in the PC utility software.

## Binary input with wire break detection

The binary inputs are based on the RMI inputs, that is if a RMI input is selected, the binary input cannot be chosen, and vice versa. When selected as multi-functional inputs, the three RMI inputs can be changed into binary inputs with wire break detection. The wire break detection is selectable (ON/OFF) and based on the RMI inputs using a 100 Ohm resistor across the monitored switch. The resulting function is:

| | |
|---|---|
| R < 20 Ohm = | Switch closed |
| 30 < R < 140 Ohm = | Switch open, cable OK |
| 150 Ohm < R = | Wire break |

The setting of the alarm input is carried out in the same way as the setting of the standard binary input. The texts can be changed in translation.

**Binary input with wire break can be used as 3 state input switch in M-Logic.**

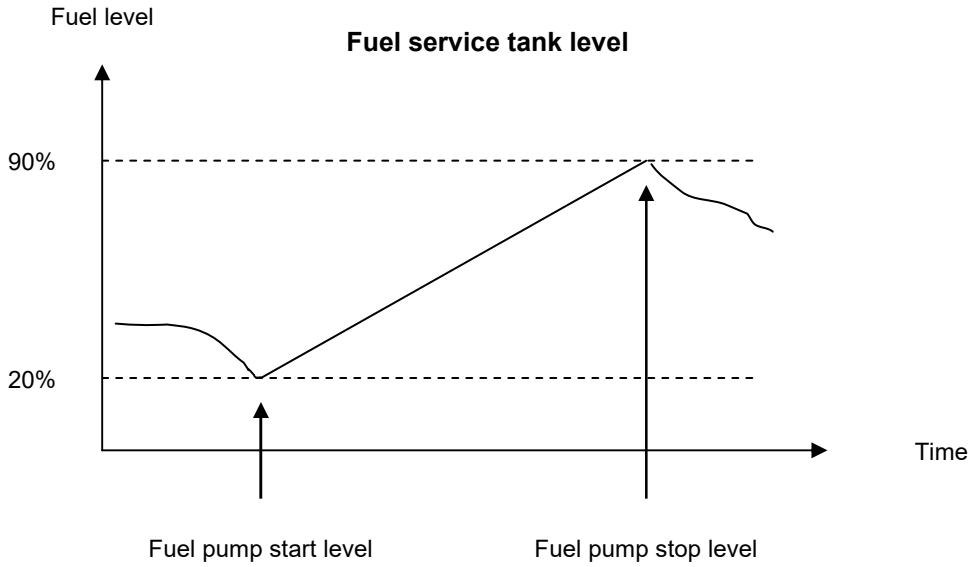
## Fuel pump logic

The fuel pump logic is used in order to start and stop the fuel supply pump to maintain the fuel level in the service tank at pre-defined levels. The start and stop limits are detected from the RMI 1 input.

**Start level, factory setting at 20 % 6550 Fuel pump logic**

**Stop level, factory setting at 90 % 6550 Fuel pump logic**

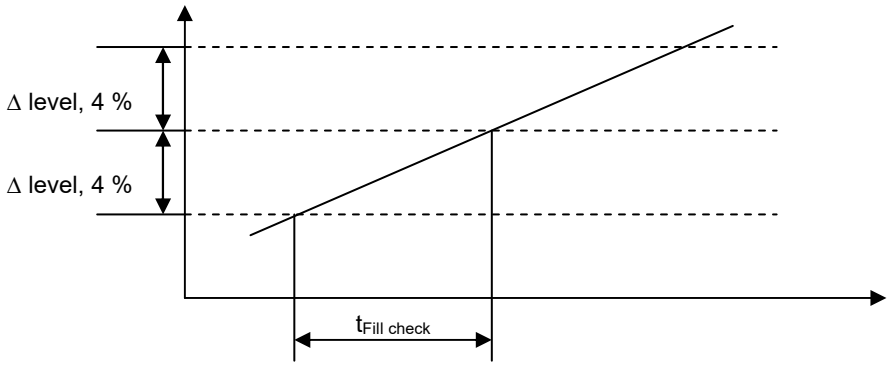
- Start level, relay activates
- Stop level, relay deactivates



### Fuel fill check

The fuel pump logic includes a *fuel fill check* function.

When the fuel pump is running, the fuel level must increase with 4 % within the *fuel fill check* timer. This timer is adjusted in 6550 Fuel pump logic, but the level of increase cannot be changed. If the fuel level does not increase at least 4 % within the adjusted delay time, then the fuel pump relay will deactivate, and a *fuel fill alarm* occurs.



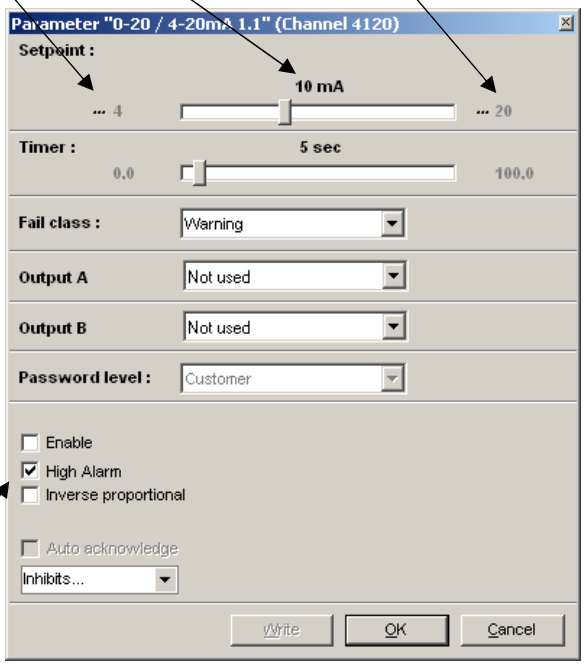

**Emergency stop will also deactivate the fuel pump.**

## Analogue inputs 0(4) to 20 mA

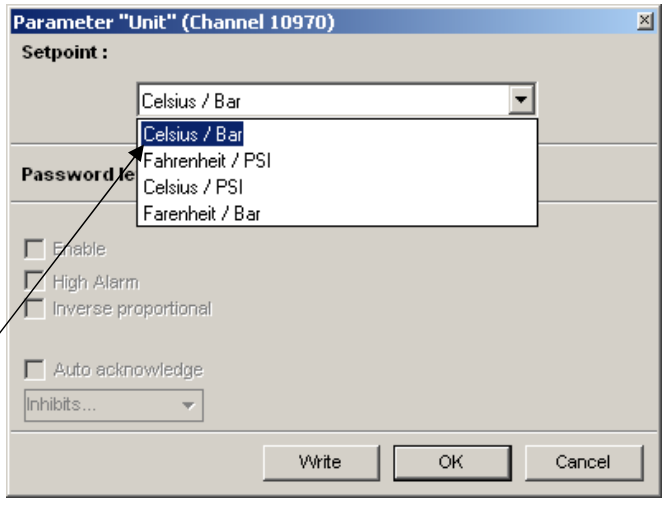
The 0(4) to 20 mA setting can *only* be set in the PC utility software.
4 to 20 mA inputs have wire break detection; the detection limit is 2.5 mA.

Settings:

Scale top point value (click the '...').
Alarm set point: Freely configurable (click the '...').
Scale low point value.




Tick boxes: Select the needed function.



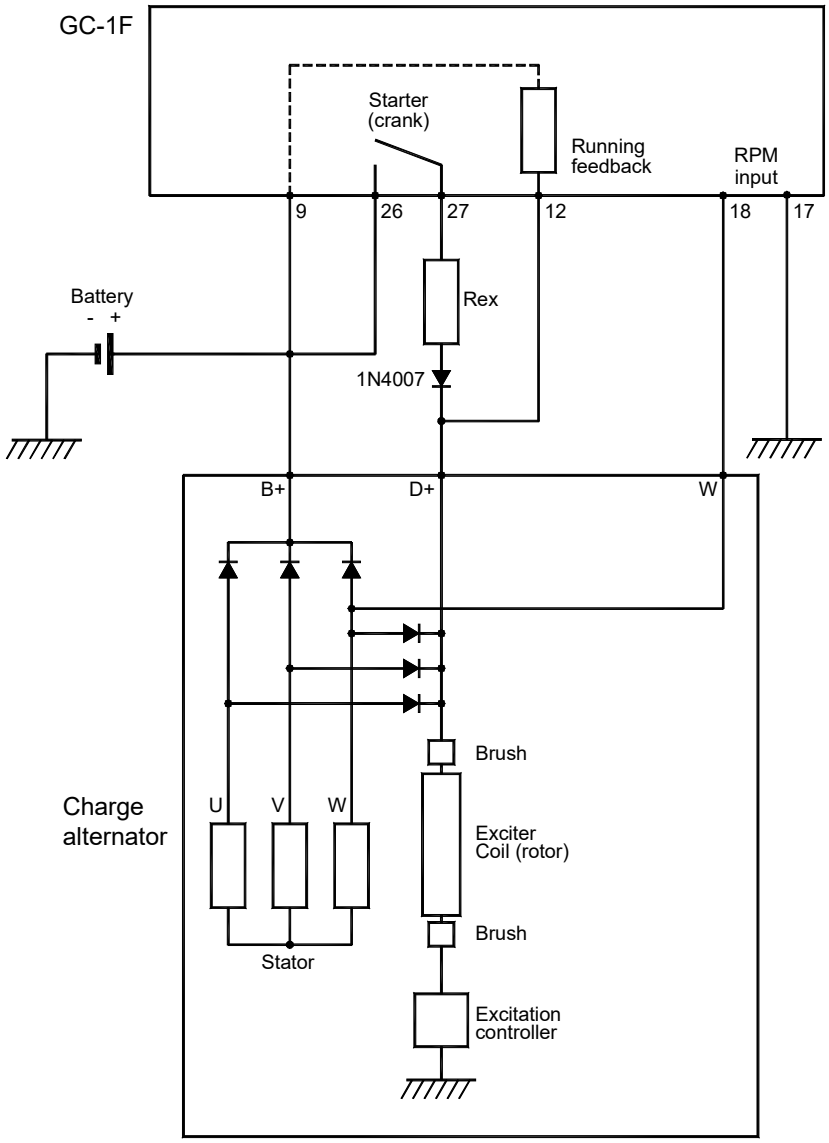

Unit: For example Bar, F, C, PSI.

## RPM inputs

### Charger alternator connections

This schematic diagram shows the basic way the charger alternator and the GC-1F can cooperate.

Only one running feedback is needed, but for optimal safety and function both the RPM (Tacho) input and the digital running feedback (D+) can be used as shown in the example below.




Rex: Excitation resistor: 12 V systems: 47 Ω 3 W
24 V systems: 100 Ω 6 W

### Charger alternator terminal W

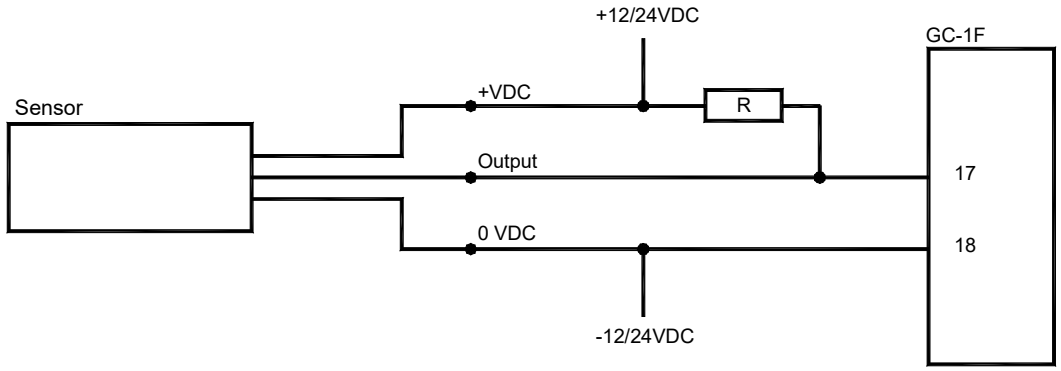
The terminal W output is an AC voltage.

### Magnetic pickup

The 2-wire magnetic pickup can be connected directly to terminals 17 to 18.

### NPN transistor output pickup

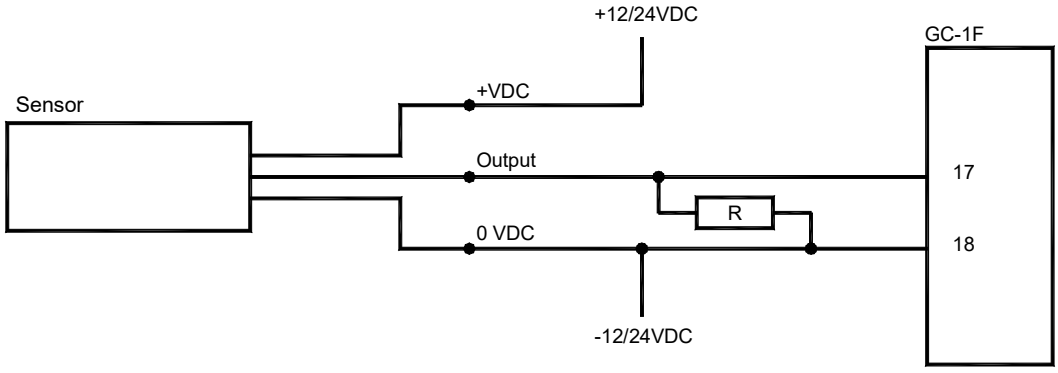
Since the NPN output is a frequency modulated DC pulse signal, a few external components are needed in order to eliminate the DC component.




R = 1200 Ω (24 V DC), 600 Ω (12 V DC)

### PNP transistor output pickup

Since the PNP output is a frequency modulated DC pulse signal, a few external components are needed in order to eliminate the DC component.




R = 1200 Ω (24 V DC), 600 Ω (12 V DC)

## Generator breaker control

### Breaker closing

Since the generator is assumed to run alone (single generator island), the breaker will close immediately when the Hz/V OK status is reached (AUTO), or if the breaker close button is activated (LOCAL). In LOCAL mode the breaker can be closed by pressing the GB close button on the front of the GC-1F, when Hz/V is OK.

### Relay output control

The generator breaker can be a contactor or pulse breaker. The preferred type can be selected in the output list. More details about pulse breakers can be found under the Breaker selection description.

**HW 1.05 and SW 2.x.x supports only pulse breakers.**

### Breaker trip control

Any alarm selected to have the fail class *Trip* or *Shutdown* will automatically open the breaker control relay. If the breaker is closed when the idle speed is activated, a breaker out signal will be transmitted.

### Breaker ON/OFF feedback

As default there is no feedback for breaker ON or OFF. The breaker position LED is paralleled to the breaker control relay output. It is possible, however, to select a binary input to be breaker ON feedback and/or an OFF feedback. This is done via an extra selection in the input settings of the PC utility software. This extra input is called *GB Pos on* or *GB Pos off* and *MB Pos on* or *MB Pos off.*

This icon activates the inputs settings: 

If the input *Breaker ON feedback* is selected, then the input must be connected and activated, if the breaker is ON. The reason is that a *Breaker close failure* alarm will appear, if the breaker control relay is activated without the binary input. Also, if the breaker control relay is OFF and the binary input is ON, then a *Breaker open failure* alarm will appear.

These alarms are fixed with the fail class *Warning*.

### Engine temperature controlled GB closing

This function can be used, if it is recommendable that the engine cooling water temperature must be above a certain temperature before the engine is loaded. In the parameter 6360 it is possible to set the cooling water temperature that must be exceeded, before the generator breaker is closed.

The function is also enabled/disabled in parameter 6360. An engine heating message is displayed, until the engine cooling water temperature has reached the set point in parameter 6360.

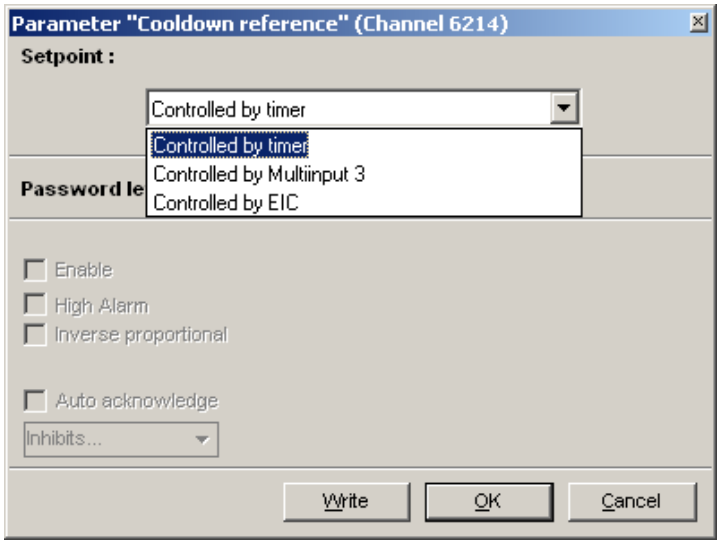
The engine cooling water temperature sensor must be selected to be a RMI sensor to make the function work. If the option B3 (AMF logic) is enabled, this function will also work upon a mains failure.

### Cool-down controlled by engine temperature

The engine temperature-controlled cool-down is to ensure that the engine is cooled down below the set point in parameter 6213 “Cool-down temperature” before the engine is stopped. This is particularly beneficial if the engine has been running for a short period of time, and therefore has not achieved normal cooling water temperature, as the cool-down period will be very short or none at all and hereby save fuel. If the engine has been running for a long period it will have reached normal running temperature, the cool-down period will be the exact time it takes to lower the temperature to be less than the temperature in set point 6213.

If, for some reason, the engine cannot lower the temperature below the temperature set point in 6213 within the time limit in parameter 6560, the engine will be shut down due to this timer. The reason for this could be high ambient temperature.

The temperature-controlled cool-down function is selected in parameter 6214.




## Test function

The GC-1F has two test sequences with or without option B3. The test sequences can be initiated in two ways: Either with the test push-button on the front of the GC-1F or by a digital input configured to this function.

**The GC-1F must be in auto mode in order to initiate the test sequence.**

### Island test function

When the Island test is initiated, the GC-1F will go through the start sequence and run the engine for the time set in parameter 7090. In this parameter, it is also selected if this sequence should be started by a digital input and/or the test push-button on the front of the GC-1F. If the timer is set to 0, the test sequence will be interrupted when the digital input or test push-button is deactivated. This means that digital input can be used to activate and deactivate the test sequence. When the timer runs out or the input is deactivated (timer set to 0), the stop sequence including cooling down will be carried out.

### AMF test function (B3-dependent)

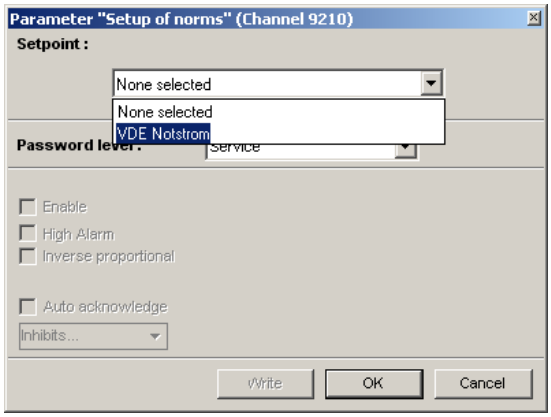
When the AMF test is initiated, the GC-1F will go through the AMF sequence and run the engine for the time set in parameter 7040. In this parameter it is also selected if this sequence should be started by a digital input and/or the test push-button on the front of the GC-1F. If the timer is set to 0, the test sequence will be interrupted when the digital input or test push-button is deactivated. This means that digital input can be used to activate and deactivate the test sequence. When the timer runs out or the input is deactivated (timer set to 0), the mains restore sequence and the stop sequence including cooling down will be carried out.

## Off mode

Description

- OFF mode is a mode like AUTO/MAN
- To enter OFF mode, parameter 9210 must be set to: “VDE Notstrom”
- OFF mode can be entered in MAN mode by pressing the “Stop” button.
- GC-1F will then go into OFF mode.
- Limit functionality
  - GB is switched OFF
  - LEDs for AUTO/MAN are OFF, and “OFF” will be displayed.
  - It is not possible to do anything with the breaker/start buttons.
  - MB is switched ON (if the voltage/frequency are ok)(if MB is available)

- Leave OFF mode by pushing MAN or AUTO mode.
- Shut down alarms do not set GC-1F into OFF mode.

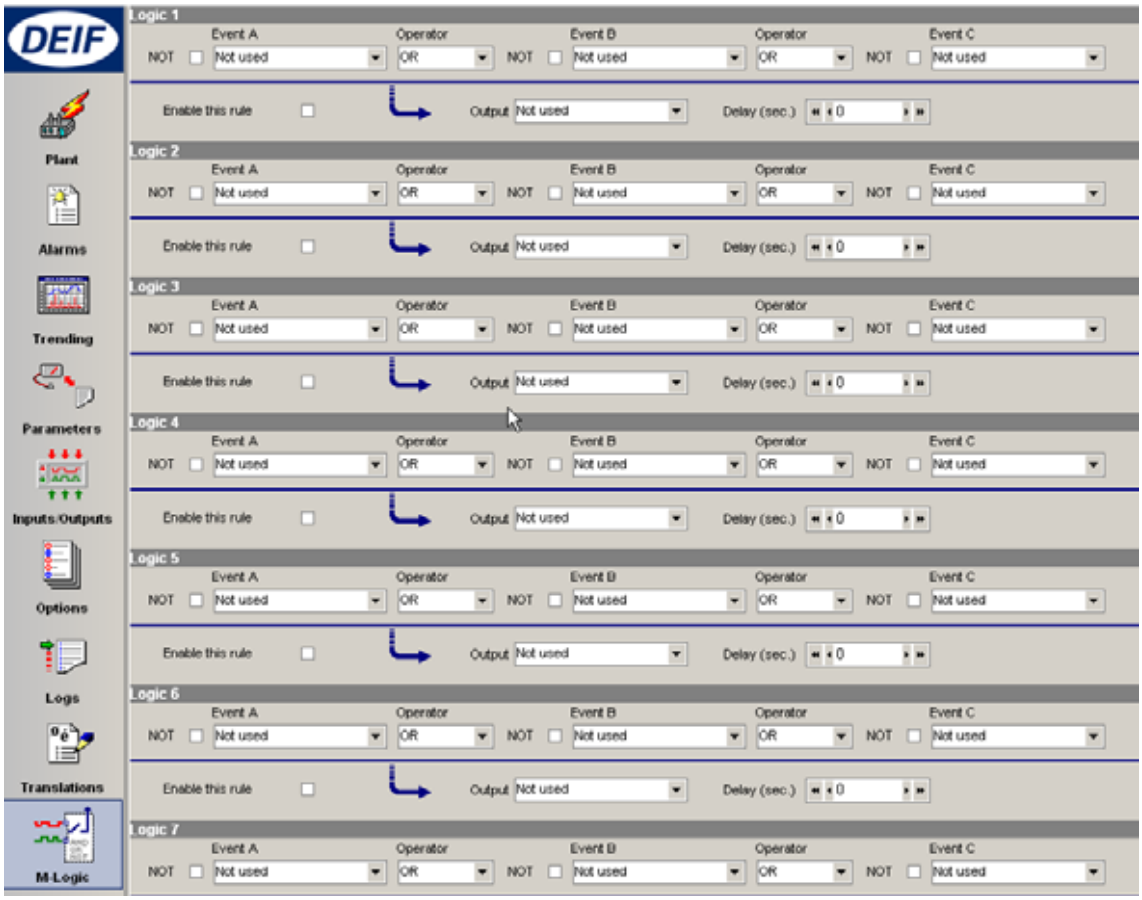



**To enter OFF mode, parameter 9210 must be set to “VDE Notstrom” which is the German term for OFF mode.**

**OFF mode will only be available in HW 1.05 and SW 2.1x.x.**

## M-Logic

M-Logic functionality is included in the unit and is not an option-dependent function.




M-Logic is used to execute different commands at pre-defined conditions. M-Logic is not a PLC but substitutes one, if only very simple commands are needed.

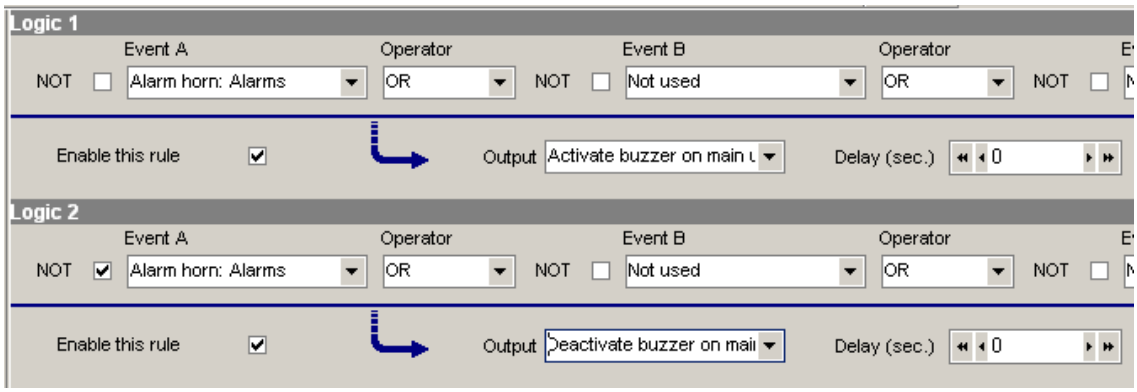
M-Logic is a simple tool based on logic events. One or more input conditions are defined, and at the activation of those inputs the defined output will occur. A great variety of inputs can be selected, such as digital inputs, alarm conditions and running conditions. A variety of the outputs can also be selected, such as relay outputs, change of genset modes, alarm LEDs and change of running modes.

**The M-Logic is part of the PC utility software, and as such it can only be configured in the PC utility software and not via the display.**

The main purpose of M-Logic is to give the operator/designer more flexible possibilities of operating the generator control system.

## Buzzer

The GC-1F has a built-in buzzer. The buzzer is configured in M-Logic. This means that if the buzzer is going to be used as a horn annunciator, the input must be set to “Horn” and the output must be set to “Buzzer”. The buzzer will act concurrently to the horn output timer. If the delay timer in M-Logic is used, the buzzer will be active after this time delay. See example below.

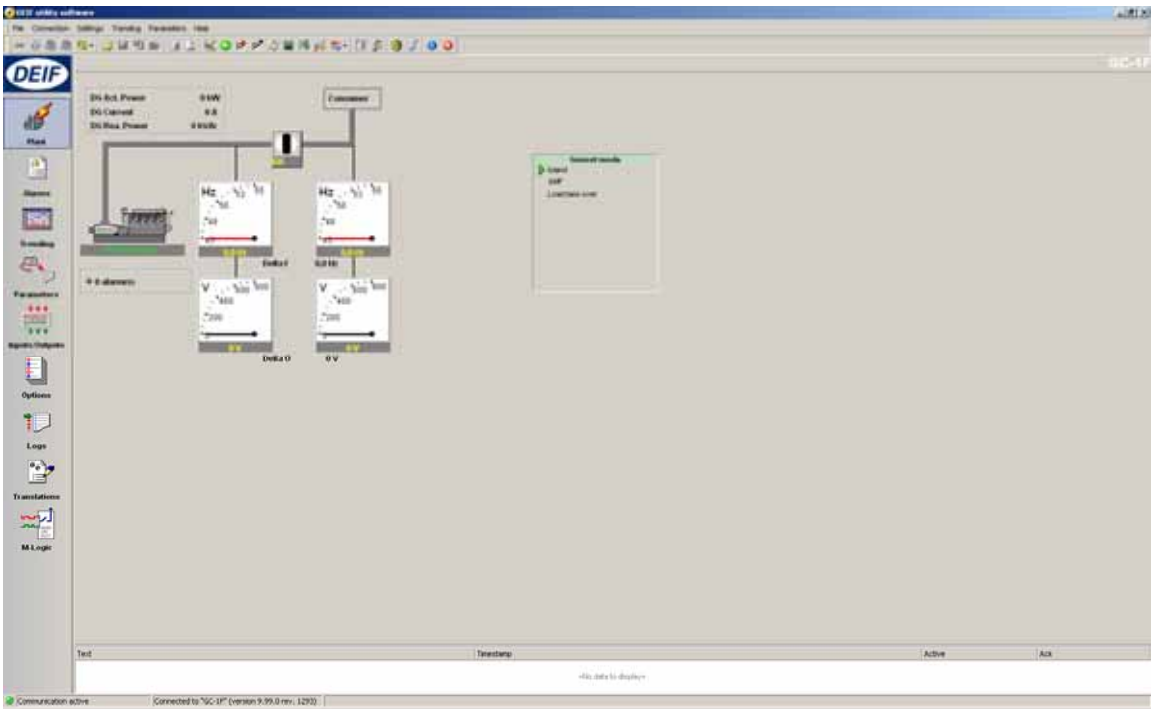



**If an AOP-2 is connected, the buzzer in the AOP-2 must be configured under the AOP-2 setup. But the configuration of the AOP-2 buzzer is similar to the above.**

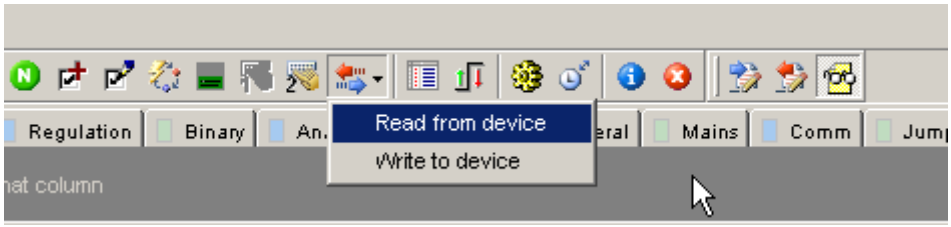
## Upgrade of firmware

1. *Connect PC to GC-1F using either DEIF programming interface box (option J5) or USB interface cable (option J9)*

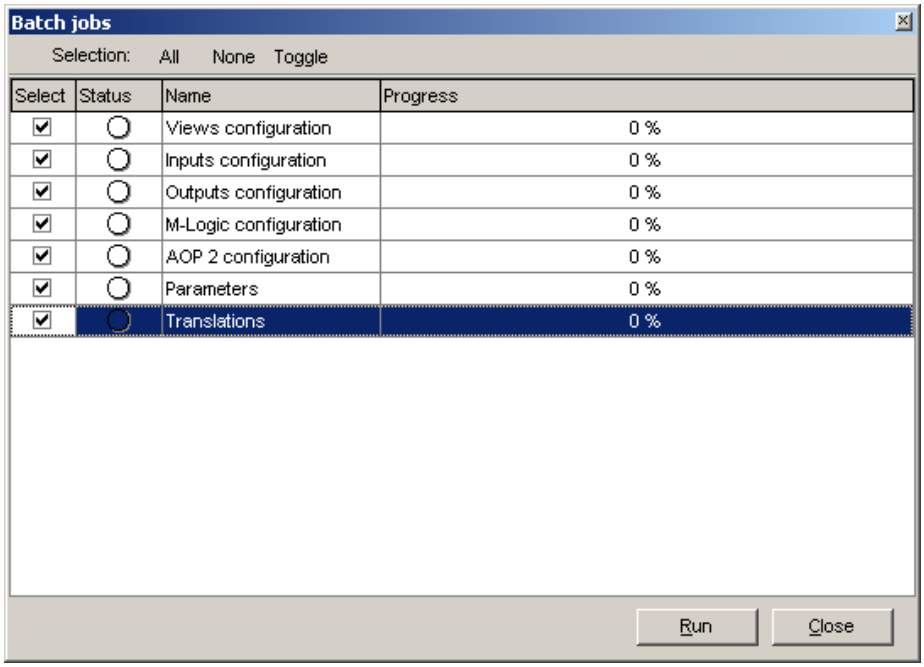
2. *Open utility software (USW) and connect to GC-1F*



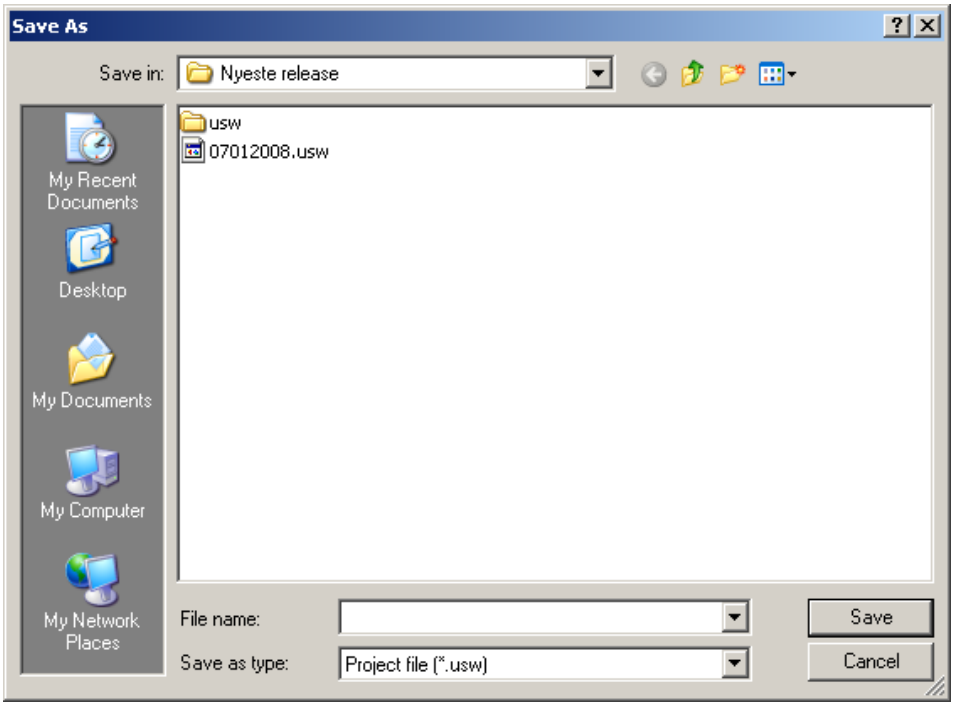
3. *Read parameters from GC-1F using "Batch job" function*



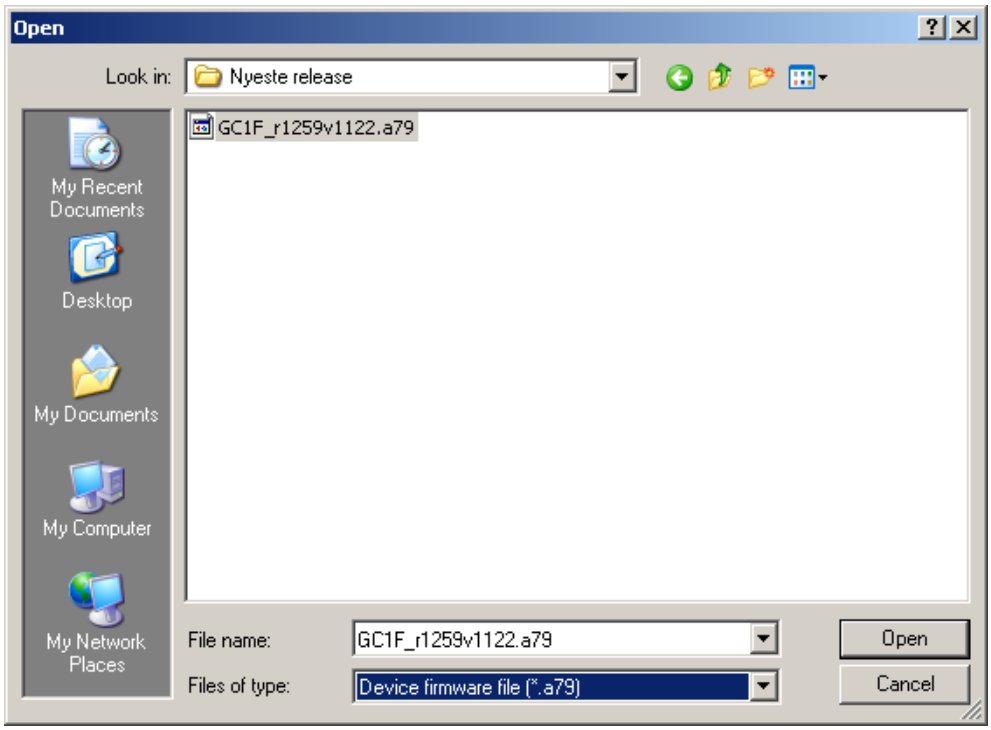
4. *Select parameters to be saved in USW project file.*




5. *Choose file name and where to save project file on PC*




6. *Press Firmware update button and select new application software (*.A79 file)*

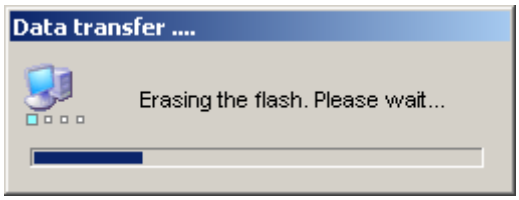



*New application software can be downloaded from [www.deif.com](http://www.deif.com)*

*This will force GC-1F into boot mode.*

***The four alarm LEDs in the front of the GC-1F will start to light one after one. Slow rotation will indicate erase of flash memory and fast rotation which indicates programming of flash memory.***

**Firmware 2.x.x downloaded into hardware 1.02 will NOT work and all four alarm LEDs will flash red and indicate error.**

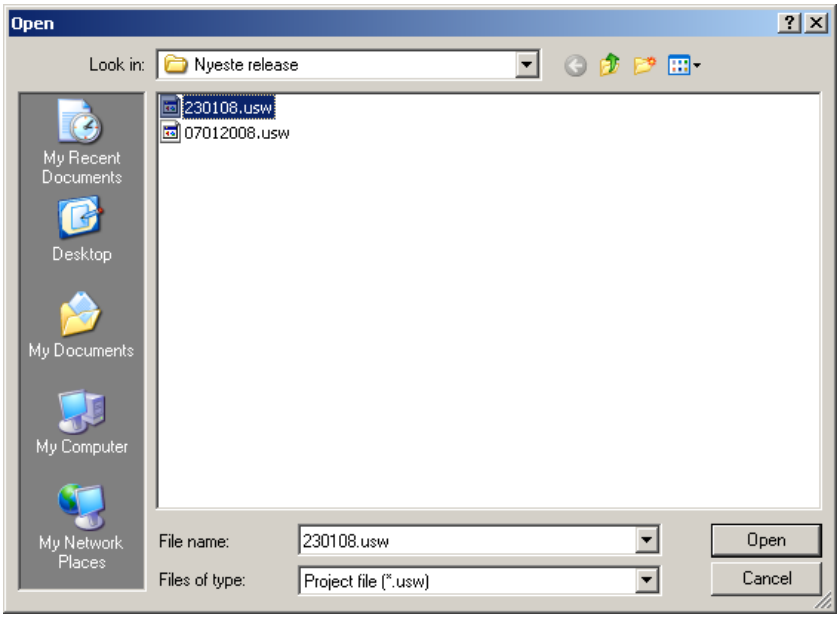



**If the programming should be interrupted, it is possible to force the unit back into boot mode by disconnecting aux. voltage. Press and hold the "Stop" button. Connect aux. voltage, and the unit is in boot mode.**

**Boot-mode with hardware: 1.02 Alarm LED 1 = Red**
**1.05 Alarm LED 1 + 3 = Yellow**

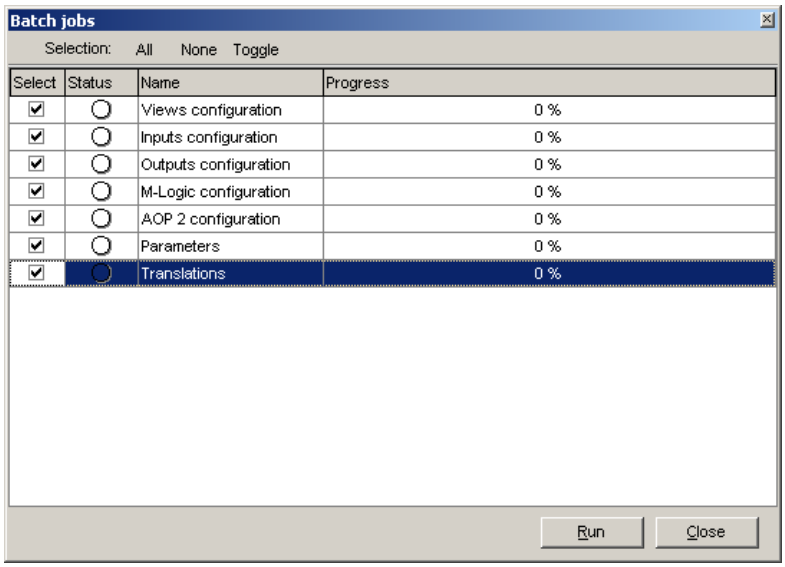
7. *When download of new firmware is done, saved parameters can be downloaded into unit.*

8. *Open saved project file from PC* 




9. *Write to device, using "Batch job" function*


10. *Select parameters that are to be downloaded into the unit.*




11. *Restart unit*

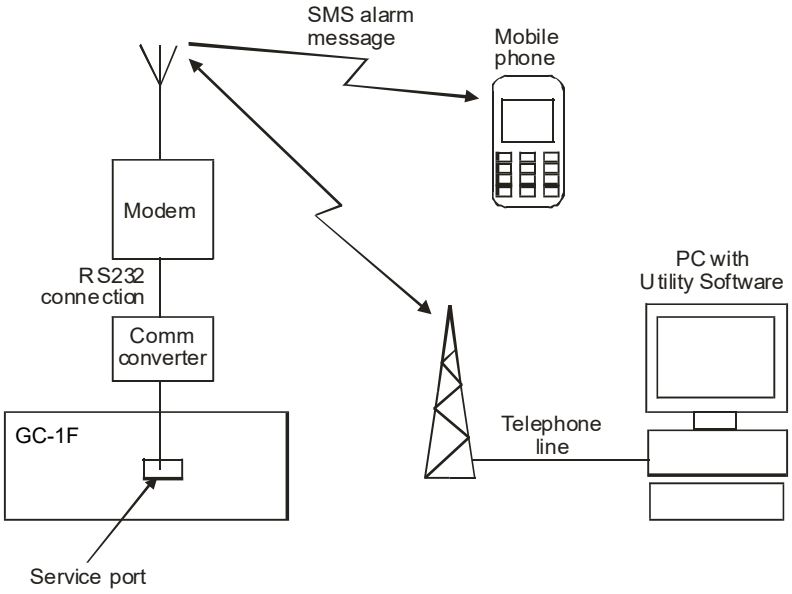
## GSM and modem communication

GSM communication can be used for two purposes:

1. Sending SMS alarm messages to up to five different mobile phones. The messages will be clear text, representing the alarm in question (for example “Overspeed”) and an ID. The ID represents the total numbers of sent SMS.

2. Communicate with the GC-1F PC utility software.

Connection:




The connection is based on an RS-232 connection to a GSM modem via the service port on the GC-1F. Since the connection on the GC-1F is a TTL communication, the interface box PI-1 (option J5) is needed to convert the signals to RS-232. The PI-1 connects via a cable with SUB-D 9-pin female connector on the modem side.

We recommend using Westermo GDW-11 modem. The easiest way to get the modem is to purchase it through a local dealer. The SIM card needed must support data transfer. Contact your GSM provider for details. The easiest way to set the PIN code in the modem itself is to mount the SIM card in a mobile phone and change the PIN code there. The SIM card will remember the PIN code when it is installed in the modem.

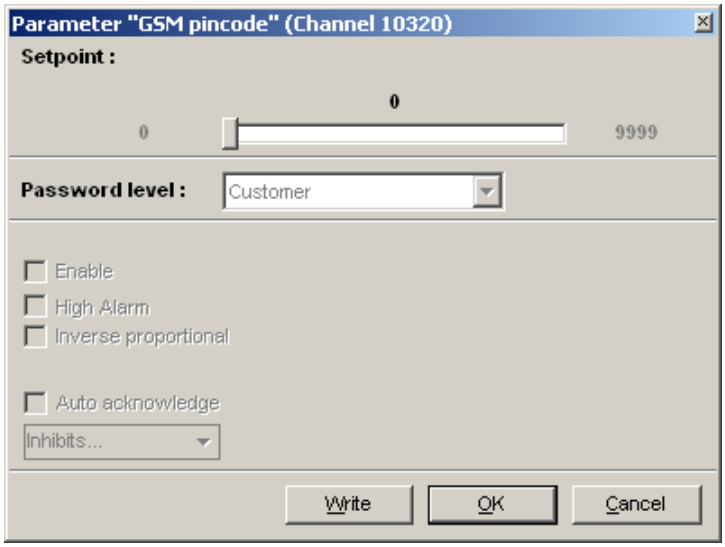
Should an alarm occur during the interruption, the GC-1F unit will re-transmit it when the modem starts again, so no messages are lost.

The setting of communication protocol ASCII or RTU can be set in the display.

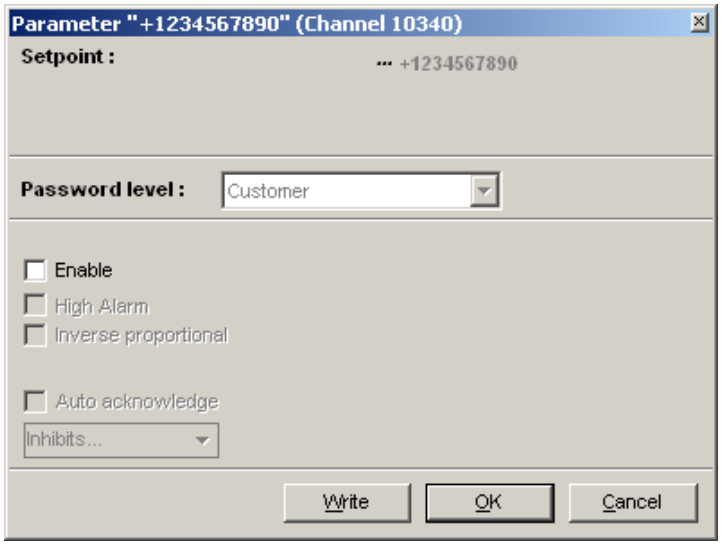
## SMS alarms

**SIM card must support data transfer. Contact your GSM provider for details.**

1. Set up GSM pin code.




2. Set up alarm call numbers.




3. Connect GSM modem to service port.
4. Disconnect aux. supply to GC-1F.
5. Connect aux. supply to GC-1F.
6. GC-1F will then set up the GSM modem under start-up.

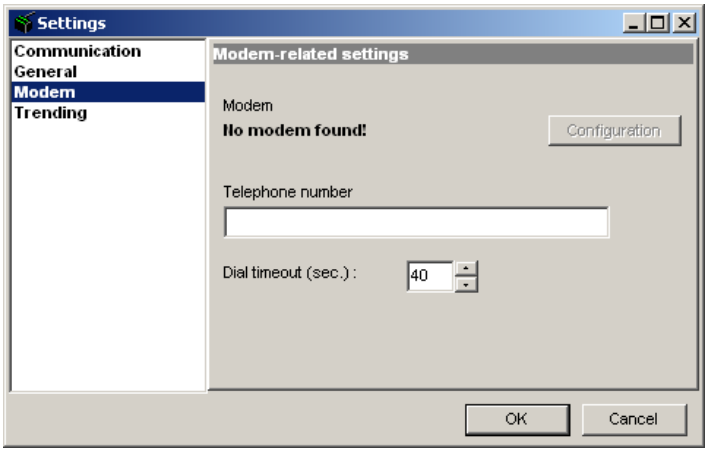
## PC utility software connection via modem

**If a PC utility software connection is required, the SIM card must support data transfer. Contact your GSM provider for details.**

### PC utility software

Press the application settings push-button.

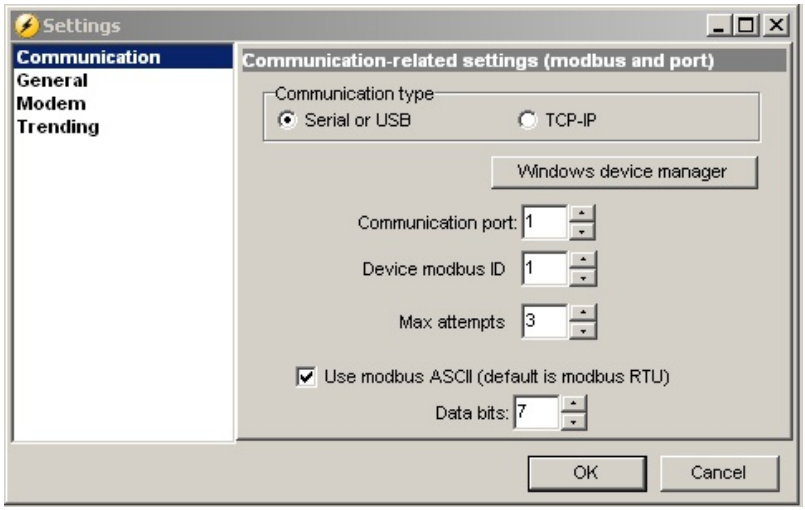
The settings dialogue box appears:



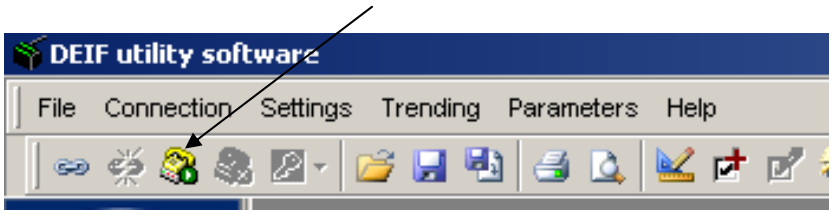

Select modem and key in the telephone number of your GSM modem connected to the unit.

**In the above example, the modem is selected automatically by the PC utility software (internal modem in the PC).**

When you want to use modem dial-up, the PC utility software must also be set to run ASCII 7 bits data communication:



After this, dial-up can be used: Click the telephone button:



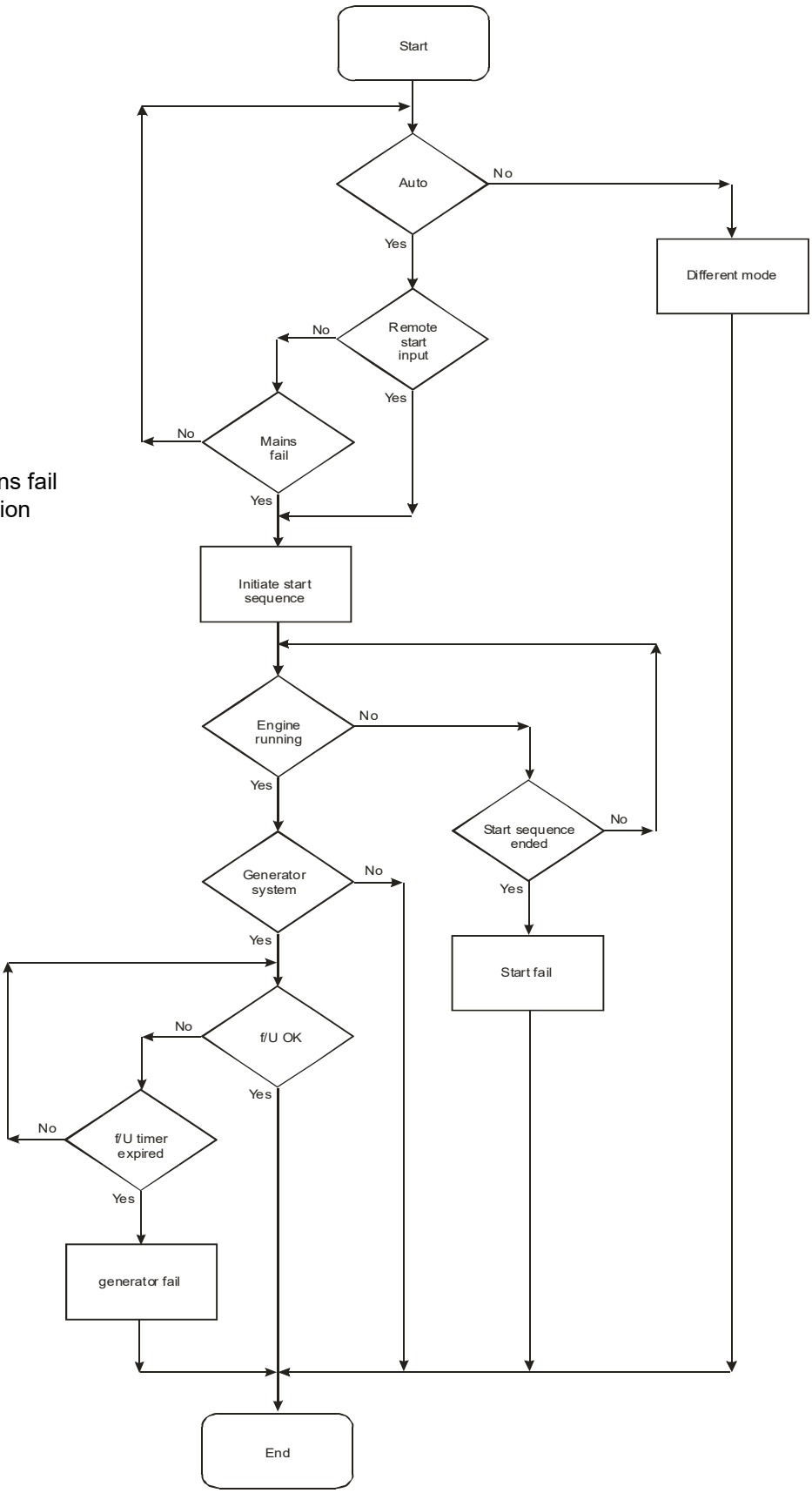

**The modem communication is much slower than the normal direct connection, so please be patient. It is not recommended to download the entire setting list. Use single setting downloads.**

## PC utility software communication safety

If the communication fails, the GC-1F unit will operate according to the received data. If for example only half of the parameter file has been downloaded when the communication is interrupted, the settings are going to be a mix.

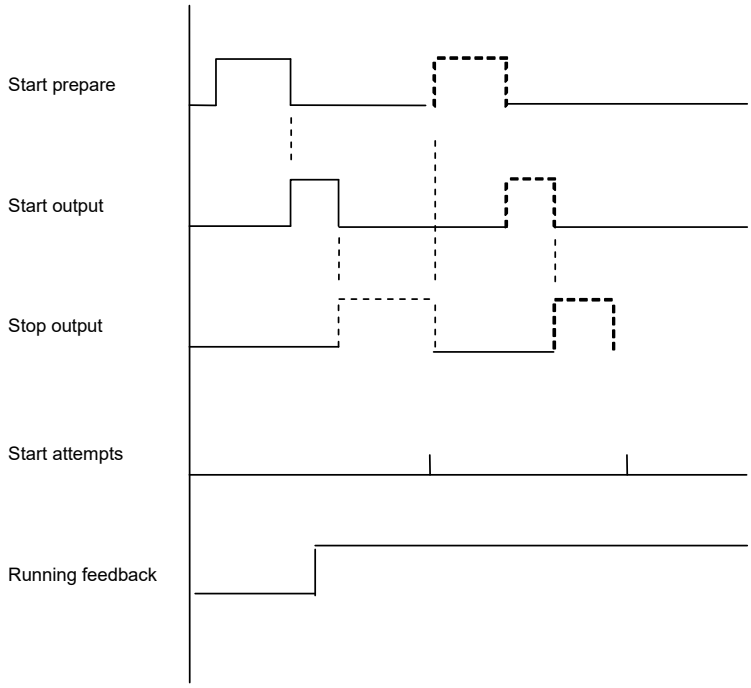
## Auto engine start

The mains fail is an option

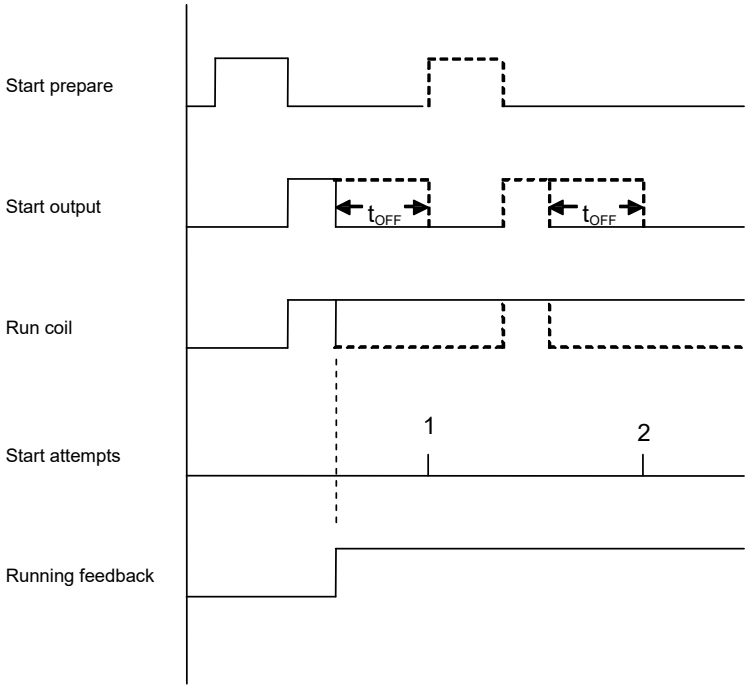


# Start sequences

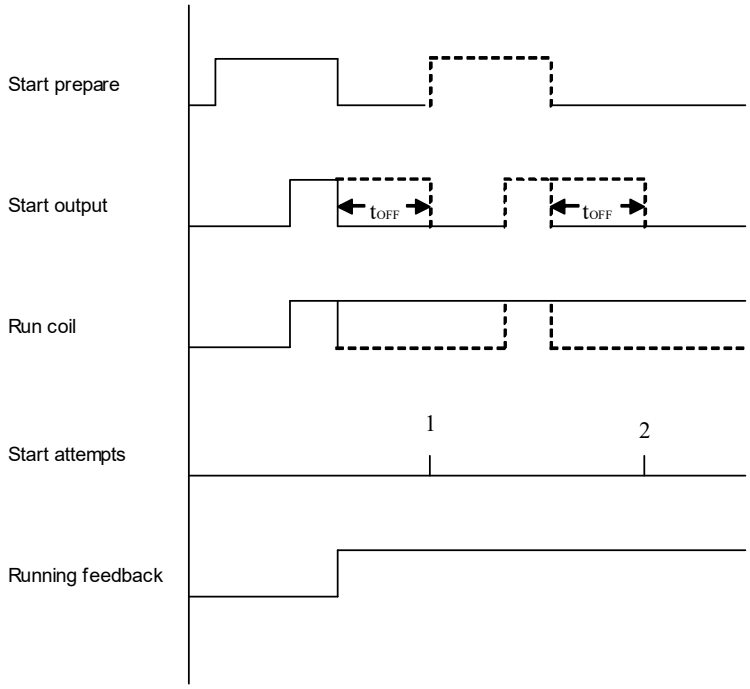
**Start sequence**
Stop coil/normal prepare



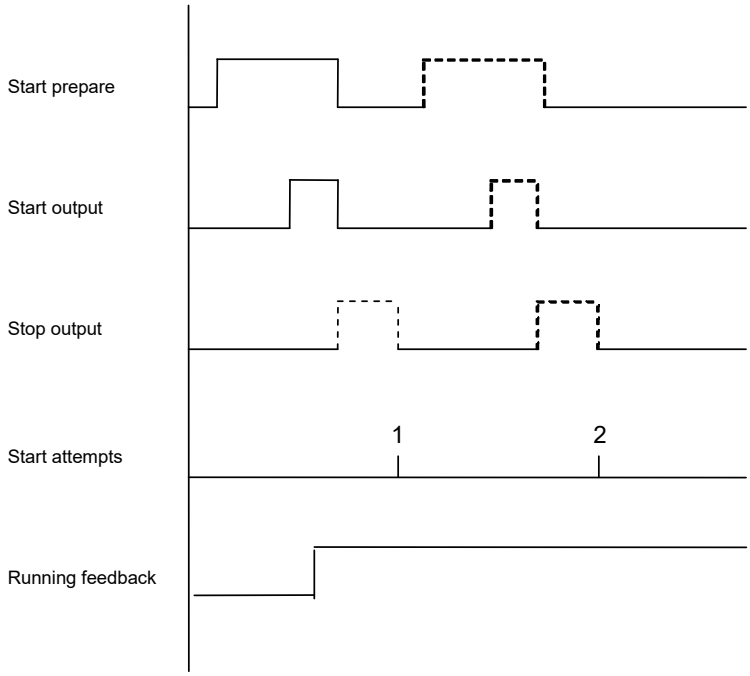

**Start sequence**
Run coil/normal prepare

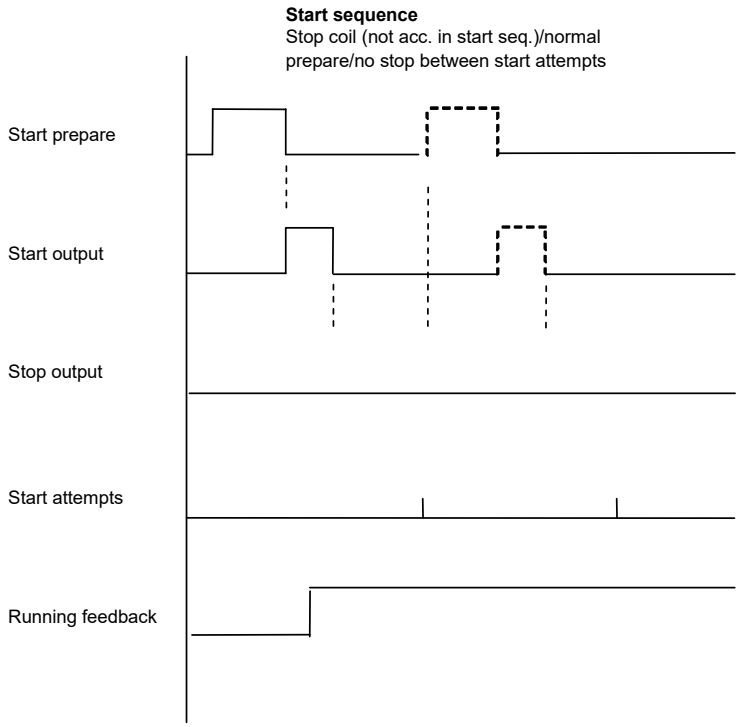


**Start sequence**:
Run coil / extended prepare




**Start sequence**
Stop coil/extended prepare




Start sequence
Stop coil (not acc. in start seq.)/normal
prepare/no stop between start attempts
Start prepare
Start output
Stop output
Start attempts
Running feedback

### Running feedbacks

- **Voltage/frequency**
  The frequency measurement requires a voltage measurement of 30 % $U_{NOM}$. So the running feedback based on the frequency measurement can only be used where the voltage builds up rapidly.

*Selectable running feedbacks*

- **RPM input**
  Tacho RUN set point, menu 6173
- **Charger alternator W input**
  Charger gen. detect menu 4610 (uses the same RUN set point as RPM input, menu 6173)
- **D+**
  Binary input
- **Oil pressure**
  RUN detect menu 6570

### Interruption of start sequence

The start sequence is interrupted in the following situations:

| Event | Comment |
|---|---|
| Auto mode stop | Removal of start cause (binary input) or shutdown. |
| Start failure | |
| Running feedback | |
| Emergency stop | |
| Stop push-button on the display | In manual as well as in auto operation. |

Start failure alarm - Auto only: Select Auto
The start failure alarm will occur, if the engine has not started after the last start attempt (that is the last crank period). A start failure will activate the HORN output and relay outputs if selected.

### Start prepare

There are two possibilities for use of the start prepare timer:

| | |
|---|---|
| Normal start prepare | The start prepare relay is activated when the start sequence is initiated for the adjusted time and before each start attempt. It deactivates before cranking. |
| Extended start prepare | The start prepare relay is activated when the start sequence is initiated, and it stays activated when cranking. |

### 6230 GB close delay

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 6231 | GB close delay | Timer | 0.0 s | 30.0 s | 0.5 s |

### 6233 GB pulse ON time

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 6234 | GB pulse ON time | Timer | 0.1 s | 10.0 s | 0.5 s |

### 6290 Idle mode

Idle mode can be selected in two ways:

1. Configurable binary input
2. Timer setting

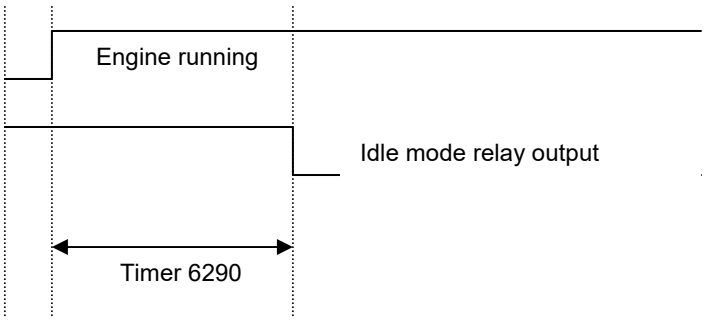
If a binary input for idle mode is used, activating this will hold the engine in idle mode as long as the input is activated. This works for both manual and auto mode. Any time the idle mode is activated, the generator breaker will be opened.

If a binary input is not used, a timer function can be set to hold the engine in idle upon start until the timer runs out. This function can be selected to be:

- Off (no idling of engine upon start)

- Modes:
  - Manual and auto: Select Man./Aut.
  - Manual only: Select Man.
  - Auto only: Select Aut.

In all cases, a relay must be selected to Idle in the output list. When idle mode is selected, a delay where the engine is running at low RPM is given. The delay is controlled by the GC-1F, and a relay output will activate the idle control on the engine.




### Engine heater

The external heater function can be used to turn on an external heat source, when the engine cooling water temperature gets below the limit in parameter 6320. When the engine cooling water temperature reaches the temperature set point in parameter 6330, the heater is turned off again.

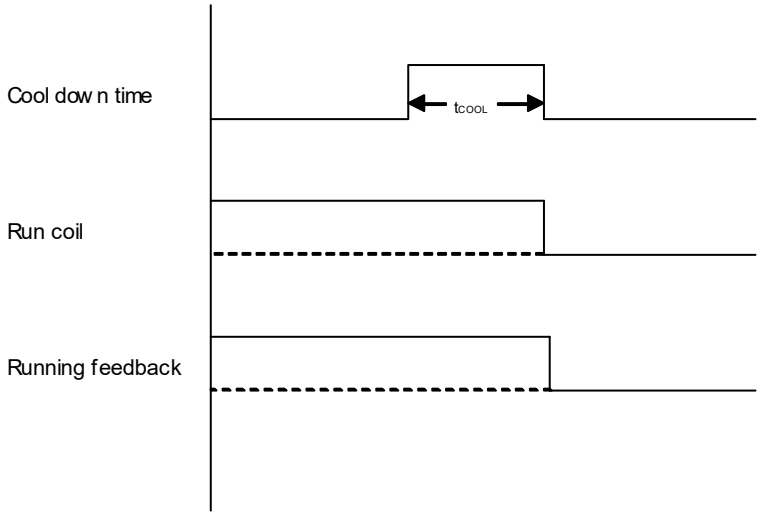
A relay must be selected in the output list to turn this external heat source on/off. The relay will close to turn the heater on or open to turn it off.

This function will only work, if the engine cooling water temperature sensor is selected to be a RMI sensor.

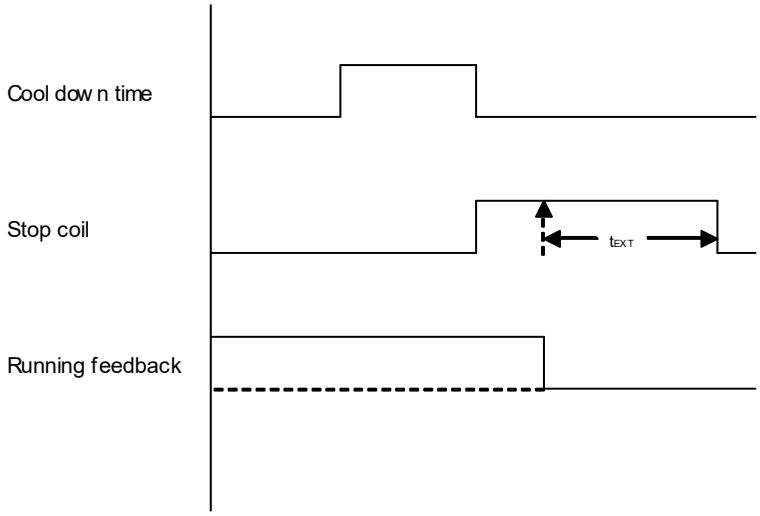
## Stop sequences

The illustrations indicate the stop sequence schematically.

**Stop sequence** / RUN coil




**Stop sequence**/Stop coil and Stop coil (not acc. in start seq.)



### Stop sequence

The stop sequence will be activated, if a stop command is given. The stop sequence can include the cooling down time, if the stop is a normal or controlled stop.

| Description | Cooling down | Stop | Comment |
|---|---|---|---|
| Auto mode stop | X | X | |
| Trip and stop | X | X | |
| Stop button on display | | X | |
| Binary shutdown input | | X | |
| Emergency stop | | X | Engine shutdown and GB opens |
| Stop command (M-Logic) | | X | |

The stop sequence can only be interrupted during the cool down period. Interruptions can occur in these situations:

| Event | Comment |
|---|---|
| | |
| Start button is pressed | Manual mode only<br>Engine will run in idle speed if idle is ON |
| Binary start input | Auto mode |
| GB close button is pressed | Manual mode only |

### Stop failure alarm

A stop failure alarm will occur, if the running feedback (or the generator voltage and frequency) is still present. The stop failure timer is adjusted in menu 4580. Stop failure will activate the HORN output, and relay outputs if selected. Factory setting is no relay outputs besides horn.

# 7. Parameter list

This chapter includes a complete standard parameter list for setup. Therefore, this chapter is to be used for reference when information about specific parameters is needed.

## Parameter groups

In the parameter overview, the parameters are divided into three parameter groups. The parameter groups can be enabled and disabled in the parameters 6950 to 6970. If a parameter group is enabled, the parameters will be accessible from the display of the GC-1F. To see the specific parameter, refer to the parameter list. If for example a parameter is marked (P2), it is available from the display, if parameter group 2 is enabled. The default display parameter setting is the parameter setting that will always be present in the display parameter list. These parameters are marked with a *.

## Setup

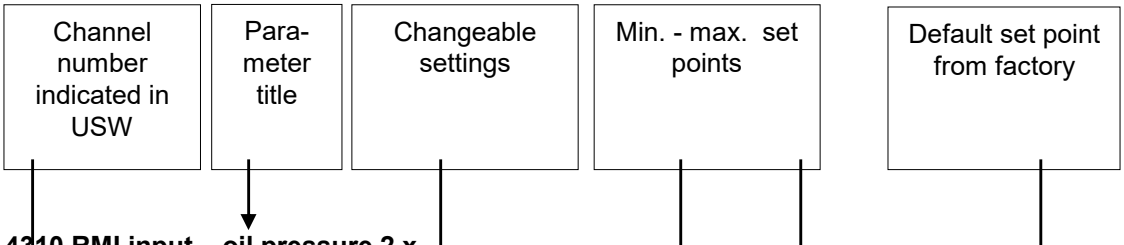
The setup of parameters is performed via the display or the PC utility software (USW). Therefore, the default settings can be changed to the relevant settings through the utility software or by means of the push-buttons on the display.

The settings can be entered through the setup menu. If no entry has taken place before, then the first display to appear is the password display. Enter the factory setting password to gain access to the menus.

**The factory customer password is 2000. The factory service password is 2001.**

If no action has been taken after 30 seconds, then the password entry will be deactivated, and a new password entry is needed. (If entry via the USW is used, the password is only needed once per connection).

Each parameter description is structured according to the same principles. Under the parameter title heading, the detailed parameter descriptions are illustrated and presented. First, a table indicating the parameter facts related to the individual parameter title is presented:




**4310 RMI input – oil pressure 2.x**

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 4311 | Oil pressure 2.1 | Set point | 0.0 bar | 10.0 bar | 4.0 bar |
| 4312 | Oil pressure 2.1 | Delay | 0.0 s | 100.0 s | 5.0 s |
| 4313 | Oil pressure 2.1 | Output A | R0 (none) | R26 (relay 26) | R0 (none) |
| 4314 | Oil pressure 2.1 | Output B | R0 (none) | R26 (relay 26) | R0 (none) |
| 4315 | Oil pressure 2.1 | Enable | OFF | ON | OFF |
| 4316 | Oil pressure 2.1 | Fail class | Warning | Shutdown | Trip of GB |

The first column indicates the channel number in the USW.

The second column indicates the changeable setting in the PC utility software.

The third and fourth columns indicate the minimum/maximum set point available for this setting.

The fifth column indicates the default set point of the unit from the factory.

When it is necessary, additional information will be supplied after the table in order to make the individual parameter descriptions as informative as possible.

## Parameter overview

**Parameter group 1 (Disp. view settings)**
6181 Start prepare
6183 Start On time
6184 Start Off time
6211 Cool-down
6212 Extended stop

**Parameter group 2 (Disp. view settings)**
1030 Over-current 1: Delay + Set point
1040 Over-current 2: Delay + Set point
1130 Gen short circuit 1 Delay + Set point
1140 Gen short circuit 2 Delay + Set point
1150 Over-voltage 1: Delay + Set point
1160 Over-voltage 2: Delay + Set point
1170 Under-voltage 1: Delay + Set point
1180 Under-voltage 2: Delay + Set point
1210 Over-frequency 1: Delay + Set point
1220 Over-frequency 2: Delay + Set point
1240 Under-frequency 1: Delay + Set point
1250 Under-frequency 2: Delay + Set point
1450 Overload 1: Delay + Set point
1460 Overload 2: Delay + Set point

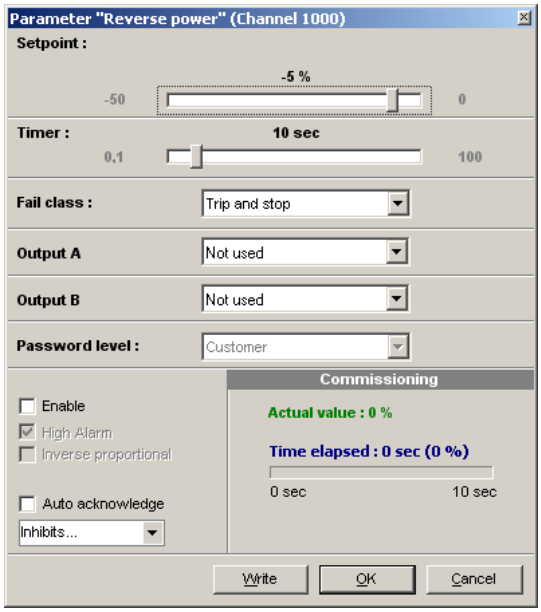
**Parameter group 3 (Disp. view settings)**
4220 Fuel 1.1: Delay + Set point*
4230 Fuel 1.2: Delay + Set point*
4620 Fuel 1.3: Delay + Set point*
4600 V-belt: Delay
4610 Charger gen: Delay
6350 D+: Delay
6550 Fuel pump: Delay*
6551 Fuel pump 1: Set point*
6552 Fuel pump 2: Set point*
** Only shown if multi-input 1 is set to RMI*

**Always shown parameters in display**
1985 Ext. run fb. fail
4560 Hz/V failure timer
4580 Stop fail
4960 Battery low 1: Delay + Set point
4970 Battery High: Delay + Set point
6070 Genset mode (B3)
6101 Running time
6103 Number of GB operations
6104 Number of MB operations (B3)
6105 kWh reset
6112 Service timer 1: Hours
6113 Service timer 1: Days
6116 Service timer 1: Reset
6122 Service timer 2: Hours
6123 Service timer 2: Days
6126 Service timer 2: Reset
6130 Alarm horn
6221 Hz/V OK timer
6222 Hz/V OK voltage
6223 Hz/V OK frequency
6901 Alarm jump
7041 AMF test time (B3)
7062 Mains OK U (B3)
7065 Mains failure U low (B3)
7066 Mains failure U high (B3)
7072 Mains OK f (B3)
7075 Mains failure f low (B3)
7076 Mains failure f high (B3)
7091 Island test time
7513 Service mode (RTU/ASCII)
7560 Engine I/F
7565 EIC Auto view (H5)
9151 Backlight dimmer
Hour adjust. ( “Sync. clock” to PC button)
Minutes adjust. ( “Sync. Clock” to PC button)
Seconds Adjust.( “Sync. Clock” to PC button)
Date adjust ( “Sync. Clock” to PC button)
Month adjust ( “Sync. Clock” to PC button)
Year adjust ( “Sync. Clock" to PC button)

**Parameters only configurable from USW**
1000 Reverse power
1620 Mains voltage unbalance
2150 Phase sequence error
2200-2210 MB control
2280 Phase rotation
2160-2170 GB control
2770 EIC control
3000-3050 Digital input term. 10-15
3490 Emergency stop
3400…3420 **Binary** multi-input settings
4120…4390 **mA** input settings
4310…4470 **RMI** multi-input settings
4510 Gen. overspeed 1
4520 Gen. overspeed 2
4580 Stop fail
4630 Low water temp.
4950 Battery low 2
5000...5060 Relay functions
6001…6005 Nominal settings 1
6006 Enable nom. Settings
6011…6015 Nominal settings 2

6021…6025 Nominal settings 3 (1 ph)
6031…6035 Nominal settings 4 (2ph)
6041 Transformer U pri. Gen.
6042 Transformer U sec. Gen.
6043 Transformer I pri. Gen.
6044 Transformer I sec. Gen.
6050 Transformer mains
6080 Language
6101 Running time
6160 Run status
6171 Tacho – teeth
6173 Tacho – run set point
6191 Start attempts
6213 Cool-down temperature
6214 Cool-down reference
6230 GB close delay
6290 Idle mode
**Parameters only configurable from USW**
6320 Engine heater ON
6330 Engine heater OFF
6560 Cool-down timeout
6570 Oil pres. RUN detect
6700 Diode compensation
6940 Alarm LED function
6950 Parameter group 1
6960 Parameter group 2
6970 Parameter group 3
6980 Sleep mode settings
7040 AMF test function
7060-7110 Mains settings
7090 Island test function
7510-7520 Modbus comm. settings
7570-7660 EIC alarms configuration
7940+7980 CAN 2 settings
7950 KL320x config.
9116 Password – customer
9117 Password – service
10000 Cmd.1 Tim/start/stop
10010 Cmd.1 Days(S)
10020 Cmd.1 Hour(S)
10030 Cmd.1 Minute(S)
10040…10310 Cmd.2…..Cmd.8
10320-10370 GSM pin code and numbers
10470-10610 Fuel level config. sensor
10640-10780 Oil pressure config. sensor
10810-10950 Water temp. config sensor
10970 Unit settings
10980 Multi-input 1 selection (RMI/mA/Bin)
10990 Multi-input 2 selection (RMI/mA/Bin)
11000 Multi-input 3 selection (RMI/mA/Bin)

### Parameter table description




The table consists of the following possible adjustments:

Set point: The alarm set point is adjusted in the set point menu. The setting can be in percentage of the nominal values.

Timer (delay): The timer setting is the time that must expire from the alarm level is reached until the alarm occurs.

Relay output A: A relay can be activated by output A.

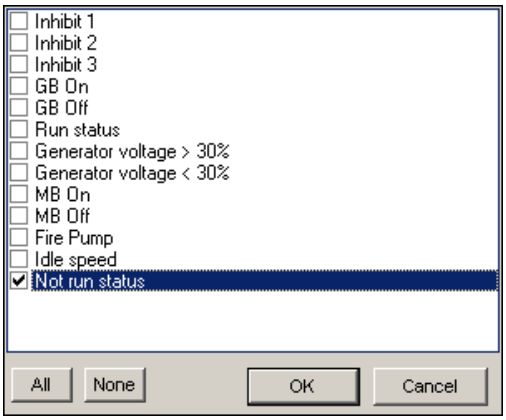
Relay output B: A relay can be activated by output B.

Enable: The alarm can be activated or deactivated. ON means always activated.

Auto acknowledge: Alarms are auto-acknowledged when the alarm becomes inactive.

Inhibits: It is possible to inhibit some of the alarms. This means it is only activated when the running feedback signal is present.

Inhibit functions:



Fail class: When the alarm occurs, the unit will react depending on the selected fail class.

**Small differences due to the character of the parameters may exist between the individual tables.**

## Fail class

The fail class settings for the protections have the following possibilities:

| Value | Comment |
|---|---|
| 0: Warning | Shown in alarm pop-up window and activates the chosen relays. |
| 1: Trip GB (CB1) | Shown in alarm pop-up window and activates the chosen relays. Trips the breaker. |
| 2: Trip and stop | Shown in alarm pop-up window and activates the chosen relays. Trips the breaker, cools down the engine and stops it. |
| 3: Shutdown | Shown in alarm pop-up window and activates the chosen relays. Trips the breaker and shuts the engine down immediately. |
| 4: Trip of MB (CB2) | Shown in alarm pop-up window and activates the chosen relays. Trips the breaker. |
| 5: Shutdown + Manual mode | Same as “shutdown” but also change to Manual mode. |

# Engine alarm settings (protection)

### 1000 Reverse power

| No. | Setting | | Min. setting | Max. setting | Third setting | Factory setting |
|---|---|---|---|---|---|---|
| 1001 | Reverse power | Set point | -50.0 % | 0.0 % | - | -5.0 % |
| 1002 | Reverse power | Timer | 0.1 s | 100.0 s | - | 10.0 s |
| 1003 | Reverse power | Relay output A | R0 (none) | R26 (relay 26) | - | R0 none) |
| 1004 | Reverse power | Relay output B | R0 (none) | R26 (relay 26) | - | R0 none) |
| 1005 | Reverse power | Enable | OFF | ON | Inhibit | ON |
| 1006 | Reverse power | Fail class | Warning | Shutdown | - | Trip |

### 1030 Gen Over-current 1

| No. | Setting | | Min. setting | Max. setting | Third setting | Factory setting |
|---|---|---|---|---|---|---|
| 1031 | Over-current 1 (P2) | Set point | 50.0 % | 200.0 % | - | 115.0 % |
| 1032 | Over-current 1 (P2) | Timer | 0.1 s | 3200.0 s | - | 10.0 s |
| 1033 | Over-current 1 | Relay output A | R0 (none) | R26 (relay 26) | - | R0 (none) |
| 1034 | Over-current 1 | Relay output B | R0 (none) | R26 (relay 26) | - | R0 (none) |
| 1035 | Over-current 1 | Enable | OFF | ON | Inhibit | ON |
| 1036 | Over-current 1 | Fail class | Warning | Shutdown | - | Trip |

### 1040 Gen Over-current 2

| No. | Setting | | Min. setting | Max. setting | Third setting | Factory setting |
|---|---|---|---|---|---|---|
| 1041 | Over-current 2 (P2) | Set point | 50.0 % | 200.0 % | - | 120.0 % |
| 1042 | Over-current 2 (P2) | Timer | 0.1 s | 3200.0 s | - | 5.0 s |
| 1043 | Over-current 2 | Relay output A | R0 (none) | R26 (relay 26) | - | R0 (none) |
| 1044 | Over-current 2 | Relay output B | R0 (none) | R26 (relay 26) | - | R0 (none) |
| 1045 | Over-current 2 | Enable | OFF | ON | Inhibit | ON |
| 1046 | Over-current 2 | Fail class | Warning | Shutdown | - | Trip |

### 1130 Gen Short circuit 1

| No. | Setting | | Min. setting | Max. setting | Third setting | Factory setting |
|---|---|---|---|---|---|---|
| 1131 | Over-current 2 (P2) | Set point | 150.0 % | 350.0 % | - | 150.0 % |
| 1132 | Over-current 2 (P2) | Timer | 0 s | 100.0 s | - | 2.0 s |
| 1133 | Over-current 2 | Relay output A | R0 (none) | R26 (relay 26) | - | R0 (none) |
| 1134 | Over-current 2 | Relay output B | R0 (none) | R26 (relay 26) | - | R0 (none) |
| 1135 | Over-current 2 | Enable | OFF | ON | Inhibit | ON |
| 1136 | Over-current 2 | Fail class | Warning | Shutdown | - | Warning |

### 1140 Gen Short circuit 2

| No. | Setting | | Min. setting | Max. setting | Third setting | Factory setting |
|---|---|---|---|---|---|---|
| 1141 | Over-current 2 (P2) | Set point | 150.0 % | 350.0 % | - | 150.0 % |
| 1142 | Over-current 2 (P2) | Timer | 0 s | 100.0 s | - | 2.0 s |
| 1143 | Over-current 2 | Relay output A | R0 (none) | R26 (relay 26) | - | R0 (none) |
| 1144 | Over-current 2 | Relay output B | R0 (none) | R26 (relay 26) | - | R0 (none) |
| 1145 | Over-current 2 | Enable | OFF | ON | Inhibit | ON |
| 1146 | Over-current 2 | Fail class | Warning | Shutdown | - | Trip GB |

**Menu 1130 + 1140 is only available if GC-1F hardware is 1.05 and software 2.0x.x**

### 1150 Gen over-voltage

| No. | Setting | | Min. setting | Max. setting | Third setting | Factory setting |
|---|---|---|---|---|---|---|
| 1151 | Over-voltage (P2) | Set point | 80.0 % | 150.0 % | - | 115.0 % |
| 1152 | Over-voltage (P2) | Timer | 0.1 s | 100.0 s | - | 10.0 s |
| 1153 | Over-voltage | Relay output A | R0 (none) | R26 (relay 26) | - | R0 (none) |
| 1154 | Over-voltage | Relay output B | R0 (none) | R26 (relay 26) | - | R0 (none) |
| 1155 | Over-voltage | Enable | OFF | ON | Inhibit | ON |
| 1156 | Over-voltage | Fail class | Warning | Shutdown | - | Warning |

### 1160 Gen over-voltage 2

| No. | Setting | | Min. setting | Max. setting | Third setting | Factory setting |
|---|---|---|---|---|---|---|
| 1161 | Over-voltage2(P2) | Set point | 80.0 % | 120.0 % | - | 117.0 % |
| 1162 | Over-voltage2(P2) | Timer | 0.1 s | 100.0 s | - | 10.0 s |
| 1163 | Over-voltage2 | Relay output A | R0 (none) | R26 (relay 26) | - | R0 (none) |
| 1164 | Over-voltage2 | Relay output B | R0 (none) | R26 (relay 26) | - | R0 (none) |
| 1165 | Over-voltage2 | Enable | OFF | ON | Inhibits | ON |
| 1166 | Over-voltage2 | Fail class | Warning | Shutdown | - | Warning |

### 1170 Gen under-voltage

| No. | Setting | | Min. setting | Max. setting | Third setting | Factory setting |
|---|---|---|---|---|---|---|
| 1171 | Under-voltage (P2) | Set point | 50.0 % | 110.0 % | - | 90.0 % |
| 1172 | Under-voltage (P2) | Timer | 0.1 s | 100.0 s | - | 5.0 s |
| 1173 | Under-voltage | Relay output A | R0 (none) | R26 (relay 26) | - | R0 (none) |
| 1174 | Under-voltage | Relay output B | R0 (none) | R26 (relay 26) | - | R0 (none) |
| 1175 | Under-voltage | Enable | OFF | ON | Inhibit | ON |
| 1176 | Under-voltage | Fail class | Warning | Shutdown | - | Warning |

### 1180 Gen under-voltage 2

| No. | Setting | | Min. setting | Max. setting | Third setting | Factory setting |
|---|---|---|---|---|---|---|
| 1171 | Under-voltage2(P2) | Set point | 50.0 % | 110.0 % | - | 85.0 % |
| 1172 | Under-voltage2(P2) | Timer | 0.1 s | 100.0 s | - | 5.0 s |
| 1173 | Under-voltage2 | Relay output A | R0 (none) | R26 (relay 26) | - | R0 (none) |
| 1174 | Under-voltage2 | Relay output B | R0 (none) | R26 (relay 26) | - | R0 (none) |
| 1175 | Under-voltage2 | Enable | OFF | ON | Inhibits | ON |
| 1176 | Under-voltage2 | Fail class | Warning | Shutdown | - | Warning |

### 1210 Gen over-frequency

| No. | Setting | | Min. setting | Max. setting | Third setting | Factory setting |
|---|---|---|---|---|---|---|
| 1211 | Over-frequency (P2) | Set point | 80.0 % | 150.0 % | - | 115.0 % |
| 1212 | Over-frequency (P2) | Timer | 0.1 s | 100.0 s | - | 10.0 s |
| 1213 | Over-frequency | Relay output A | R0 (none) | R26 (relay 26) | - | R0 (none) |
| 1214 | Over-frequency | Relay output B | R0 (none) | R26 (relay 26) | - | R0 (none) |
| 1215 | Over-frequency | Enable | OFF | ON | Inhibit | ON |
| 1216 | Over-frequency | Fail class | Warning | Shutdown | - | Warning |

### 1220 Gen over-frequency 2

| No. | Setting | | Min. setting | Max. setting | Third setting | Factory setting |
|---|---|---|---|---|---|---|
| 1221 | Over-frequency 2 | Set point | 80.0 % | 120.0 % | - | 117.0 % |
| 1222 | Over-frequency 2 | Timer | 0.1 s | 100.0 s | - | 10.0 s |
| 1223 | Over-frequency 2 | Relay output A | R0 (none) | R26 (relay 26) | - | R0 (none) |
| 1224 | Over-frequency 2 | Relay output B | R0 (none) | R26 (relay 26) | - | R0 (none) |
| 1225 | Over-frequency 2 | Enable | OFF | ON | Inhibits | ON |
| 1226 | Over-frequency 2 | Fail class | Warning | Shutdown | - | Warning |

### 1240 Gen under-frequency

| No. | Setting | | Min. setting | Max. setting | Third setting | Factory setting |
|---|---|---|---|---|---|---|
| 1241 | Under-frequency (P2) | Set point | 50.0 % | 110.0 % | - | 90.0 % |
| 1242 | Under-frequency (P2) | Timer | 0.1 s | 100.0 s | - | 5.0 s |
| 1243 | Under-frequency | Relay output A | R0 (none) | R26 (relay 26) | - | R0 (none) |
| 1244 | Under-frequency | Relay output B | R0 (none) | R26 (relay 26) | - | R0 (none) |
| 1245 | Under-frequency | Enable | OFF | ON | Inhibit | ON |
| 1246 | Under-frequency | Fail class | Warning | Shutdown | - | Warning |

### 1250 Gen under-frequency 2

| No. | Setting | | Min. setting | Max. setting | Third setting | Factory setting |
|---|---|---|---|---|---|---|
| 1251 | Under-frequency 2 (P2) | Set point | 50.0 % | 110.0 % | - | 85.0 % |
| 1252 | Under-frequency 2 (P2) | Timer | 0.1 s | 100.0 s | - | 5.0 s |
| 1253 | Under-frequency 2 | Relay output A | R0 (none) | R26 (relay 26) | - | R0 (none) |
| 1254 | Under-frequency 2 | Relay output B | R0 (none) | R26 (relay 26) | - | R0 (none) |
| 1255 | Under-frequency 2 | Enable | OFF | ON | Inhibits | ON |
| 1256 | Under-frequency 2 | Fail class | Warning | Shutdown | - | Warning |

**Busbar protections are only available in HW 1.05 and SW 2.x.x**

### 1270 Busbar over-voltage

| No. | Setting | | Min. setting | Max. setting | Third setting | Factory setting |
|---|---|---|---|---|---|---|
| 1151 | Over-voltage | Set point | 80.0 % | 150.0 % | - | 115.0 % |
| 1152 | Over-voltage | Timer | 0.1 s | 100.0 s | - | 10.0 s |
| 1153 | Over-voltage | Relay output A | R0 (none) | R26 (relay 26) | - | R0 (none) |
| 1154 | Over-voltage | Relay output B | R0 (none) | R26 (relay 26) | - | R0 (none) |
| 1155 | Over-voltage | Enable | OFF | ON | Inhibit | ON |
| 1156 | Over-voltage | Fail class | Warning | Shutdown | - | Warning |

### 1280 Busbar over-voltage 2

| No. | Setting | | Min. setting | Max. setting | Third setting | Factory setting |
|---|---|---|---|---|---|---|
| 1161 | Over-voltage2 | Set point | 80.0 % | 120.0 % | - | 117.0 % |
| 1162 | Over-voltage2 | Timer | 0.1 s | 100.0 s | - | 10.0 s |
| 1163 | Over-voltage2 | Relay output A | R0 (none) | R26 (relay 26) | - | R0 (none) |
| 1164 | Over-voltage2 | Relay output B | R0 (none) | R26 (relay 26) | - | R0 (none) |
| 1165 | Over-voltage2 | Enable | OFF | ON | Inhibits | ON |
| 1166 | Over-voltage2 | Fail class | Warning | Shutdown | - | Warning |

### 1300 Busbar under-voltage

| No. | Setting | | Min. setting | Max. setting | Third setting | Factory setting |
|---|---|---|---|---|---|---|
| 1171 | Under-voltage | Set point | 50.0 % | 110.0 % | - | 90.0 % |
| 1172 | Under-voltage | Timer | 0.1 s | 100.0 s | - | 5.0 s |
| 1173 | Under-voltage | Relay output A | R0 (none) | R26 (relay 26) | - | R0 (none) |
| 1174 | Under-voltage | Relay output B | R0 (none) | R26 (relay 26) | - | R0 (none) |
| 1175 | Under-voltage | Enable | OFF | ON | Inhibit | ON |
| 1176 | Under-voltage | Fail class | Warning | Shutdown | - | Warning |

### 1310 Busbar under-voltage 2

| No. | Setting | | Min. setting | Max. setting | Third setting | Factory setting |
|---|---|---|---|---|---|---|
| 1171 | Under-voltage2 | Set point | 50.0 % | 110.0 % | - | 85.0 % |
| 1172 | Under-voltage2 | Timer | 0.1 s | 100.0 s | - | 5.0 s |
| 1173 | Under-voltage2 | Relay output A | R0 (none) | R26 (relay 26) | - | R0 (none) |
| 1174 | Under-voltage2 | Relay output B | R0 (none) | R26 (relay 26) | - | R0 (none) |
| 1175 | Under-voltage2 | Enable | OFF | ON | Inhibits | ON |
| 1176 | Under-voltage2 | Fail class | Warning | Shutdown | - | Warning |

### 1350 Busbar over-frequency

| No. | Setting | | Min. setting | Max. setting | Third setting | Factory setting |
|---|---|---|---|---|---|---|
| 1211 | Over-frequency | Set point | 80.0 % | 150.0 % | - | 115.0 % |
| 1212 | Over-frequency | Timer | 0.1 s | 100.0 s | - | 10.0 s |
| 1213 | Over-frequency | Relay output A | R0 (none) | R26 (relay 26) | - | R0 (none) |
| 1214 | Over-frequency | Relay output B | R0 (none) | R26 (relay 26) | - | R0 (none) |
| 1215 | Over-frequency | Enable | OFF | ON | Inhibit | ON |
| 1216 | Over-frequency | Fail class | Warning | Shutdown | - | Warning |

### 1360 Busbar over-frequency 2

| No. | Setting | | Min. setting | Max. setting | Third setting | Factory setting |
|---|---|---|---|---|---|---|
| 1221 | Over-frequency 2 | Set point | 80.0 % | 120.0 % | - | 117.0 % |
| 1222 | Over-frequency 2 | Timer | 0.1 s | 100.0 s | - | 10.0 s |
| 1223 | Over-frequency 2 | Relay output A | R0 (none) | R26 (relay 26) | - | R0 (none) |
| 1224 | Over-frequency 2 | Relay output B | R0 (none) | R26 (relay 26) | - | R0 (none) |
| 1225 | Over-frequency 2 | Enable | OFF | ON | Inhibits | ON |
| 1226 | Over-frequency 2 | Fail class | Warning | Shutdown | - | Warning |

### 1380 Busbar under-frequency

| No. | Setting | | Min. setting | Max. setting | Third setting | Factory setting |
|---|---|---|---|---|---|---|
| 1241 | Under-frequency | Set point | 50.0 % | 110.0 % | - | 90.0 % |
| 1242 | Under-frequency | Timer | 0.1 s | 100.0 s | - | 5.0 s |
| 1243 | Under-frequency | Relay output A | R0 (none) | R26 (relay 26) | - | R0 (none) |
| 1244 | Under-frequency | Relay output B | R0 (none) | R26 (relay 26) | - | R0 (none) |
| 1245 | Under-frequency | Enable | OFF | ON | Inhibit | ON |
| 1246 | Under-frequency | Fail class | Warning | Shutdown | - | Warning |

### 1390 Busbar under-frequency 2

| No. | Setting | | Min. setting | Max. setting | Third setting | Factory setting |
|---|---|---|---|---|---|---|
| 1251 | Under-frequency 2 | Set point | 50.0 % | 110.0 % | - | 85.0 % |
| 1252 | Under-frequency 2 | Timer | 0.1 s | 100.0 s | - | 5.0 s |
| 1253 | Under-frequency 2 | Relay output A | R0 (none) | R26 (relay 26) | - | R0 (none) |
| 1254 | Under-frequency 2 | Relay output B | R0 (none) | R26 (relay 26) | - | R0 (none) |
| 1255 | Under-frequency 2 | Enable | OFF | ON | Inhibits | ON |
| 1256 | Under-frequency 2 | Fail class | Warning | Shutdown | - | Warning |

### 1450 Gen overload 1

| No. | Setting | | Min. setting | Max. setting | Third setting | Factory setting |
|---|---|---|---|---|---|---|
| 1451 | Overload 1(P2) | Set point | 10.0 % | 200.0 % | - | 100.0 % |
| 1452 | Overload 1(P2) | Timer | 0.1 s | 3200.0 s | - | 5.0 s |
| 1453 | Overload 1 | Relay output A | R0 (none) | R26 (relay 26) | - | R0 (none) |
| 1454 | Overload 1 | Relay output B | R0 (none) | R26 (relay 26) | - | R0 (none) |
| 1455 | Overload 1 | Enable | OFF | ON | Inhibits | ON |
| 1456 | Overload 1 | Fail class | Warning | Shutdown | - | Warning |

### 1460 Gen overload 2

| No. | Setting | | Min. setting | Max. setting | Third setting | Factory setting |
|---|---|---|---|---|---|---|
| 1461 | Overload 2(P2) | Set point | 10.0 % | 200.0 % | - | 110.0 % |
| 1462 | Overload 2(P2) | Timer | 0.1 s | 3200.0 s | - | 5.0 s |
| 1463 | Overload 2 | Relay output A | R0 (none) | R26 (relay 26) | - | R0 (none) |
| 1464 | Overload 2 | Relay output B | R0 (none) | R26 (relay 26) | - | R0 (none) |
| 1465 | Overload 2 | Enable | OFF | ON | Inhibits | ON |
| 1466 | Overload 2 | Fail class | Warning | Shutdown | - | Warning |

### 1520 Gen –Q>

| No. | Setting | | Min. setting | Max. setting | Third setting | Factory setting |
|---|---|---|---|---|---|---|
| 1521 | –Q> (P2) | Set point | 0.0 % | 150.0 % | - | 50.0 % |
| 1522 | –Q> (P2) | Timer | 0.1 s | 100.0 s | - | 10.0 s |
| 1523 | –Q> | Relay output A | R0 (none) | R26 (relay 26) | - | R0 (none) |
| 1524 | –Q> | Relay output B | R0 (none) | R26 (relay 26) | - | R0 (none) |
| 1525 | –Q> | Enable | OFF | ON | Inhibits | OFF |
| 1526 | –Q> | Auto acknowledge | OFF | ON | | OFF |
| 1527 | –Q> | Fail class | Warning | Shutdown | - | Warning |

### 1530 Gen Q>

| No. | Setting | | Min. setting | Max. setting | Third setting | Factory setting |
|---|---|---|---|---|---|---|
| 1531 | Q> (P2) | Set point | 0.0 % | 150.0 % | - | 50.0 % |
| 1532 | Q> (P2) | Timer | 0.1 s | 100.0 s | - | 10.0 s |
| 1533 | Q> | Relay output A | R0 (none) | R26 (relay 26) | - | R0 (none) |
| 1534 | Q> | Relay output B | R0 (none) | R26 (relay 26) | - | R0 (none) |
| 1535 | Q> | Enable | OFF | ON | Inhibits | OFF |
| 1536 | Q> | Auto acknowledge | OFF | ON | | OFF |
| 1537 | Q> | Fail class | Warning | Shutdown | - | Warning |

### 1620 Mains voltage unbalance

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 1621 | Voltage unbalance | Set point | 0.0 % | 50.0 % | 10.0 % |
| 1622 | Voltage unbalance | Timer | 0.0 s | 10.0 s | 1.0 s |
| 1623 | Voltage unbalance | Relay output A | R0 (none) | R26 (relay 26) | R0 (none) |
| 1624 | Voltage unbalance | Relay output B | R0 (none) | R26 (relay 26) | R0 (none) |
| 1625 | Voltage unbalance | Enable | OFF | ON | OFF |
| 1626 | Voltage unbalance | Fail class | Warning | Shutdown | Warning |

### 1985 Ext. run fb. fail

| No. | Setting | | Min. setting | Max. setting | Third setting | Factory setting |
|---|---|---|---|---|---|---|
| 1986 | Ext. run fb. fail | Timer | 0.0 s | 20.0 s | - | 1.0 s |
| 1987 | Ext. run fb. fail | Relay output A | R0 (none) | R26 (relay 26) | | R0 (none) |
| 1988 | Ext. run fb. fail | Relay output B | R0 (none) | R26 (relay 26) | | R0 (none) |
| 1989 | Ext. run fb. fail | Enable | OFF | ON | Inhibits | OFF |
| 1990 | Ext. run fb. fail | Fail class | Warning | Shutdown | | Warning |

### 2150 Phase sequence error

| No. | Setting | | Min. setting | Max. setting | Third setting | Factory setting |
|---|---|---|---|---|---|---|
| 2152 | Phase seq error | Timer | 0.0 s | 10.0 s | - | 1.0 s |
| 2153 | Phase seq error | Relay output A | R0 (none) | R26 (relay 26) | - | R0 (none) |
| 2154 | Phase seq error | Relay output B | R0 (none) | R26 (relay 26) | - | R0 (none) |
| 2155 | Phase seq error | Enable | OFF | ON | Inhibit | OFF |
| 2156 | Phase seq error | Fail class | Warning | Shutdown | - | Warning |

### 2160 GB open failure

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 2161 | GB open failure | Timer | 0.0 s | 10.0 s | 1.0 s |

### 2170 GB close failure

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 2171 | GB close failure | Timer | 0.0 s | 10.0 s | 1.0 s |

### 2180 GB position failure

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 2181 | GB position failure | Timer | 0.0 s | 10.0 s | 1.0 s |
| 2182 | GB position failure | Enable | OFF | ON | ON |
| 2183 | GB position failure | Fail class | Warning | Shutdown | Warning |

### 2200 MB open failure

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 2201 | MB open failure | Timer | 0.0 s | 60.0 s | 1.0 s |

### 2210 MB close failure

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 2211 | MB close failure | Timer | 0.0 s | 60.0 s | 1.0 s |

### 2220 MB position failure

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 2221 | MB position failure | Timer | 0.0 s | 10.0 s | 1.0 s |
| 2222 | MB position failure | Enable | OFF | ON | ON |
| 2223 | MB position failure | Fail class | Warning | Shutdown | Warning |

### 2240 GB Ext. tripped (CB1 Ext. tripped)

| No. | Setting | | Min. setting | Max. setting | Third setting | Factory setting |
|---|---|---|---|---|---|---|
| 2241 | GB Ext. tripped | Enable | OFF | ON | Inhibit | OFF |
| 2242 | GB Ext. tripped | Fail class | Warning | Shutdown | - | Warning |

### 2240 MB Ext. tripped (CB2 Ext. tripped)

| No. | Setting | | Min. setting | Max. setting | Third setting | Factory setting |
|---|---|---|---|---|---|---|
| 2241 | MB Ext. tripped | Enable | OFF | ON | Inhibit | OFF |
| 2242 | MB Ext. tripped | Fail class | Warning | Shutdown | - | Warning |

### 2280 Phase rotation

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 2281 | Phase rotation | Set point | L1L2L3 | L1L3L2 | L1L2L3 |
| 2282 | Phase rotation | Password | Customer | Service | Customer |

**The setting of phase rotation depends on the wiring of mains L1, L2 and L3.**

### 2770 EIC control

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 2771 | EIC control | Droop | 0.0 % | 25.0 % | 0.0 % |
| 2772 | EIC control | Scania rpm | User<br>1500 rpm<br>1800 rpm<br>Low idle | | User |
| 2773 | EIC control | Cummins gain | 0.00 | 10.00 | 5.00 |

### 2774 EIC Speed Ramp

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 2775 | EIC Speed Ramp | Set point | 0.0RPM | 120.0RPM | 120.0RPM |
| 2776 | EIC Speed Ramp | Timer | 1.0 s | 100.0 s | 10.0 s |
| 2777 | EIC Speed Ramp | Enable | ON | OFF | OFF |

### 3000-3050 Digital input term. 10 to 15, without wire break

| No. | Setting | | Min. setting | Max. setting | Third setting | Factory setting |
|---|---|---|---|---|---|---|
| 30X1 | Dig. input no. XX | Timer | 0.0 s | 3200.0 s | - | 10.0 s |
| 30X2 | Dig. input no. XX | Relay output A | R0 (none) | R26 (relay 26) | - | R0 (none) |
| 30X3 | Dig. input no. XX | Relay output B | R0 (none) | R26 (relay 26) | - | R0 (none) |
| 30X4 | Dig. input no. XX | Enable | OFF | ON | Inhibit | OFF |
| 30X5 | Dig. input no. XX | Fail class | See description of fail classes | | | |
| 30X6 | Dig. input no. XX | NO/NC | NO | NC | - | NO |

### 3490 Emergency stop (terminal 19 to 20)

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 3491 | Emergency STOP | Timer | 0.0 s | 60.0 s | 0.2 s |
| 3492 | Emergency STOP | Relay output A | R0 (none) | R26 (relay 26) | R0 (none) |
| 3493 | Emergency STOP | Relay output B | R0 (none) | R26 (relay 26) | R0 (none) |
| 3494 | Emergency STOP | Enable | OFF | ON | ON |
| 3495 | Emergency STOP | Fail class | See description of fail classes | | |

## Multi-inputs

**It is possible to combine RMI inputs with binary inputs and (0)4 to 20 mA inputs in a mix.**

## Binary inputs with wire break

The text for the inputs for correct display reading can only be done via the PC utility software.

**3400 Binary input 1 (fuel)**

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 3401 | Binary input 1 | Wire break | OFF | ON | OFF |
| 3402 | Binary input 1 | Delay | 0.0 s | 100.0 s | 5.0 s |
| 3403 | Binary input 1 | Output A | R0 (none) | R26 (relay 26) | R0 (none) |
| 3404 | Binary input 1 | Output B | R0 (none) | R26 (relay 26) | R0 (none) |
| 3405 | Binary input 1 | Enable | OFF | ON | OFF |
| 3406 | Binary input 1 | Fail class | See description of fail classes | | |

**3410 Binary input 2 (oil)**

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 3411 | Binary input 2 | Wire break | OFF | ON | OFF |
| 3412 | Binary input 2 | Delay | 0.0 s | 100.0 s | 5.0 s |
| 3413 | Binary input 2 | Output A | R0 (none) | R26 (relay 26) | R0 (none) |
| 3414 | Binary input 2 | Output B | R0 (none) | R26 (relay 26) | R0 (none) |
| 3415 | Binary input 2 | Enable | OFF | ON | OFF |
| 3416 | Binary input 2 | Fail class | See description of fail classes | | |

**3420 Binary input 3 (temp.)**

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 3421 | Binary input 3 | Wire break | OFF | ON | OFF |
| 3422 | Binary input 3 | Delay | 0.0 s | 100.0 s | 5.0 s |
| 3423 | Binary input 3 | Output A | R0 (none) | R26 (relay 26) | R0 (none) |
| 3424 | Binary input 3 | Output B | R0 (none) | R26 (relay 26) | R0 (none) |
| 3425 | Binary input 3 | Enable | OFF | ON | OFF |
| 3426 | Binary input 3 | Fail class | See description of fail classes | | |

**357X-361X Mlogic alarm 01-05**

| No. | Setting | | Min. setting | Max. setting | Third setting | Factory setting |
|---|---|---|---|---|---|---|
| 3XX1 | Mlogic alarm no. XX | Timer | 0.0 s | 100.0 s | - | 0.0 s |
| 3XX2 | Mlogic alarm no. XX | Relay output A | R0 (none) | R26 (relay 26) | - | R0 (none) |
| 3XX3 | Mlogic alarm no. XX | Relay output B | R0 (none) | R26 (relay 26) | - | R0 (none) |
| 3XX4 | Mlogic alarm no. XX | Enable | OFF | ON | Inhibit | OFF |
| 3XX5 | Mlogic alarm no. XX | Fail class | See description of fail classes | | | |
| 3XX6 | Mlogic alarm no. XX | NO/NC | NO | NC | - | NO |

## Analogue inputs 0(4) to 20 mA

The scaling of the 0(4) to 20 mA inputs for correct display reading can only be done via the PC utility software.

**4 to 20 mA inputs have wire break function. Wire break alarm will be active when current goes below 2.5 mA. It is not possible to disable the wire break function.**

### 4120 0-20 4-20 mA 1.1

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 4121 | 0(4)-20 mA 1.1 | Set point | 4 mA | 20 mA | 10 mA |
| 4122 | 0(4)-20 mA 1.1 | Delay | 0.0 s | 100.0 s | 5.0 s |
| 4123 | 0(4)-20 mA 1.1 | Output A | R0 (none) | R26 (relay 26) | R0 (none) |
| 4124 | 0(4)-20 mA 1.1 | Output B | R0 (none) | R26 (relay 26) | R0 (none) |
| 4125 | 0(4)-20 mA 1.1 | Enable | OFF | ON | OFF |
| 4126 | 0(4)-20 mA 1.1 | Fail class | See description of fail classes | | |

### 4130 0-20 4-20 mA 1.2

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 4131 | 0(4)-20 mA 1.2 | Set point | 4 mA | 20 mA | 10 mA |
| 4132 | 0(4)-20 mA 1.2 | Delay | 0.0 s | 100.0 s | 5.0 s |
| 4133 | 0(4)-20 mA 1.2 | Output A | R0 (none) | R26 (relay 26) | R0 (none) |
| 4134 | 0(4)-20 mA 1.2 | Output B | R0 (none) | R26 (relay 26) | R0 (none) |
| 4135 | 0(4)-20 mA 1.2 | Enable | OFF | ON | OFF |
| 4136 | 0(4)-20 mA 1.2 | Fail class | See description of fail classes | | |

### 4250 0-20 4-20 mA 2.1

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 4251 | 0(4)-20 mA 2.1 | Set point | 4 mA | 20 mA | 10 mA |
| 4252 | 0(4)-20 mA 2.1 | Delay | 0.0 s | 100.0 s | 5.0 s |
| 4253 | 0(4)-20 mA 2.1 | Output A | R0 (none) | R26 (relay 26) | R0 (none) |
| 4254 | 0(4)-20 mA 2.1 | Output B | R0 (none) | R26 (relay 26) | R0 (none) |
| 4255 | 0(4)-20 mA 2.1 | Enable | OFF | ON | OFF |
| 4256 | 0(4)-20 mA 2.1 | Fail class | See description of fail classes | | |

### 4260 0-20 4-20 mA 2.2

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 4261 | 0(4)-20 mA 2.2 | Set point | 4 mA | 20 mA | 10 mA |
| 4262 | 0(4)-20 mA 2.2 | Delay | 0.0 s | 100.0 s | 5.0 s |
| 4263 | 0(4)-20 mA 2.2 | Output A | R0 (none) | R26 (relay 26) | R0 (none) |
| 4264 | 0(4)-20 mA 2.2 | Output B | R0 (none) | R26 (relay 26) | R0 (none) |
| 4265 | 0(4)-20 mA 2.2 | Enable | OFF | ON | OFF |
| 4266 | 0(4)-20 mA 2.2 | Fail class | See description of fail classes | | |

### 4380 0-20 4-20 mA 3.1

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 4381 | 0(4)-20 mA 3.1 | Set point | 4 mA | 20 mA | 10 mA |
| 4382 | 0(4)-20 mA 3.1 | Delay | 0.0 s | 100.0 s | 5.0 s |
| 4383 | 0(4)-20 mA 3.1 | Output A | R0 (none) | R26 (relay 26) | R0 (none) |
| 4384 | 0(4)-20 mA 3.1 | Output B | R0 (none) | R26 (relay 26) | R0 (none) |
| 4385 | 0(4)-20 mA 3.1 | Enable | OFF | ON | OFF |
| 4386 | 0(4)-20 mA 3.1 | Fail class | See description of fail classes | | |

### 4390 0-20 4-20 mA 3.2

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 4391 | 0(4)-20 mA 3.2 | Set point | 4 mA | 20 mA | 10 mA |
| 4392 | 0(4)-20 mA 3.2 | Delay | 0.0 s | 100.0 s | 5.0 s |
| 4393 | 0(4)-20 mA 3.2 | Output A | R0 (none) | R26 (relay 26) | R0 (none) |
| 4394 | 0(4)-20 mA 3.2 | Output B | R0 (none) | R26 (relay 26) | R0 (none) |
| 4395 | 0(4)-20 mA 3.2 | Enable | OFF | ON | OFF |
| 4396 | 0(4)-20 mA 3.2 | Fail class | See description of fail classes | | |

## RMI inputs

### 4220 RMI fuel level input 1.1

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 4221 | Fuel level 1.1 (P3) | Set point | 0 % | 100 % | 10 % |
| 4222 | Fuel level 1.1 (P3) | Delay | 0.0 s | 100.0 s | 5.0 s |
| 4223 | Fuel level 1.1 | Output A | R0 (none) | R26 (relay 26) | R0 (none) |
| 4224 | Fuel level 1.1 | Output B | R0 (none) | R26 (relay 26) | R0 (none) |
| 4225 | Fuel level 1.1 | Enable | OFF | ON | OFF |
| 4226 | Fuel level 1.1 | Fail class | See description of fail classes | | |

### 4230 RMI fuel level input 1.2

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 4231 | Fuel level 1.2 (P3) | Set point | 0 % | 100 % | 99 % |
| 4232 | Fuel level 1.2 (P3) | Delay | 0.0 s | 100.0 s | 5.0 s |
| 4233 | Fuel level 1.2 | Output A | R0 (none) | R26 (relay 26) | R0 (none) |
| 4234 | Fuel level 1.2 | Output B | R0 (none) | R26 (relay 26) | R0 (none) |
| 4235 | Fuel level 1.2 | Enable | OFF | ON | OFF |
| 4236 | Fuel level 1.2 | Fail class | See description of fail classes | | |

### 4310 RMI oil press. input 2.1

| No. | Setting (D) | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 4311 | RMI 2.1 | Set point | 0.0 bar | 10.0 bar | 4.0 bar |
| 4312 | RMI 2.1 | Delay | 0.0 s | 100.0 s | 5.0 s |
| 4313 | RMI 2.1 | Output A | R0 (none) | R26 (relay 26) | R0 (none) |
| 4314 | RMI 2.1 | Output B | R0 (none) | R26 (relay 26) | R0 (none) |
| 4315 | RMI 2.1 | Enable | OFF | ON | OFF |
| 4316 | RMI 2.1 | Fail class | See description of fail classes | | |

### 4320 RMI oil press. input 2.2

| No. | Setting (D) | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 4321 | RMI 2.2 | Set point | 0.0 bar | 10.0 bar | 4.0 bar |
| 4322 | RMI 2.2 | Delay | 0.0 s | 100.0 s | 5.0 s |
| 4323 | RMI 2.2 | Output A | R0 (none) | R26 (relay 26) | R0 (none) |
| 4324 | RMI 2.2 | Output B | R0 (none) | R26 (relay 26) | R0 (none) |
| 4325 | RMI 2.2 | Enable | OFF | ON | OFF |
| 4326 | RMI 2.2 | Fail class | See description of fail classes | | |

### 4460 RMI water temp. input 3.1

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 4461 | RMI 3.1 | Set point | 0 °C | 150 °C | 95 °C |
| 4462 | RMI 3.1 | Delay | 0.0 s | 100.0 s | 5.0 s |
| 4463 | RMI 3.1 | Output A | R0 (none) | R26 (relay 26) | R0 (none) |
| 4464 | RMI 3.1 | Output B | R0 (none) | R26 (relay 26) | R0 (none) |
| 4465 | RMI 3.1 | Enable | OFF | ON | OFF |
| 4466 | RMI 3.1 | Fail class | See description of fail classes | | |

### 4470 RMI water temp. input 3.2

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 4471 | RMI 3.2 | Set point | 0 °C | 150 °C | 95 °C |
| 4472 | RMI 3.2 | Delay | 0.0 s | 100.0 s | 5.0 s |
| 4473 | RMI 3.2 | Output A | R0 (none) | R26 (relay 26) | R0 (none) |
| 4474 | RMI 3.2 | Output B | R0 (none) | R26 (relay 26) | R0 (none) |
| 4475 | RMI 3.2 | Enable | OFF | ON | OFF |
| 4476 | RMI 3.2 | Fail class | See description of fail classes | | |

### 4630 RMI low coolant temp. input 3.3

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 4631 | RMI 3.3 | Set point | -50 °C | 410 °C | 10 °C |
| 4632 | RMI 3.3 | Delay | 0.0 s | 10.0 s | 1.0 s |
| 4633 | RMI 3.3 | Output A | R0 (none) | R26 (relay 26) | R0 (none) |
| 4634 | RMI 3.3 | Output B | R0 (none) | R26 (relay 26) | R0 (none) |
| 4635 | RMI 3.3 | Enable | OFF | ON | OFF |
| 4636 | RMI 3.3 | Fail class | See description of fail classes | | |

**RMI type: See functional description.**

## RPM input

### 4510 Overspeed 1 (RPM input)

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 4511 | Overspeed 1 | Set point | 0 % | 400 % | 110 % |
| 4512 | Overspeed 1 | Timer | 0.2 s | 100.0 s | 15.0 s |
| 4513 | Overspeed 1 | Relay output A | R0 (none) | R26 (relay 26) | R0 (none) |
| 4514 | Overspeed 1 | Relay output B | R0 (none) | R26 (relay 26) | R0 (none) |
| 4515 | Overspeed 1 | Enable | OFF | ON | OFF |
| 4516 | Overspeed 1 | Fail class | See description of fail classes | | |

### 4520 Overspeed 2 (RPM input)

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 4521 | Overspeed 2 | Set point | 0 % | 400 % | 110 % |
| 4522 | Overspeed 2 | Timer | 0.2 s | 100.0 s | 15.0 s |
| 4523 | Overspeed 2 | Relay output A | R0 (none) | R26 (relay 26) | R0 (none) |
| 4524 | Overspeed 2 | Relay output B | R0 (none) | R26 (relay 26) | R0 (none) |
| 4525 | Overspeed 2 | Enable | OFF | ON | OFF |
| 4526 | Overspeed 2 | Fail class | See description of fail classes | | |

**Overspeed 1 and 2 are always active if enabled regardless of nominal setting. Thus it is possible to set two levels of overspeed.**

**4560 Hz/V failure**

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 4561 | Hz/V failure* | Timer | 1.0 s | 99.0 s | 30.0 s |
| 4562 | Hz/V failure | Relay output A | R0 (none) | R26 (relay 26) | R0 (none) |
| 4563 | Hz/V failure | Relay output B | R0 (none) | R26 (relay 26) | R0 (none) |
| 4565 | Hz/V failure | Enable | OFF | ON | ON |
| 4566 | Hz/V failure | Fail class | See description of fail classes | | |

When the frequency and voltage have not been OK for the adjusted delay time, a *Hz/V failure* alarm occurs, and output A and B activate.

**4580 Stop failure**

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 4581 | Stop failure* | Timer | 10.0 s | 120.0 s | 30.0 s |
| 4582 | Stop failure | Relay output A | R0 (none) | R26 (relay 26) | R0 (none) |
| 4583 | Stop failure | Relay output B | R0 (none) | R26 (relay 26) | R0 (none) |
| 4584 | Stop failure | Enable | ON | OFF | ON |
| 4585 | Stop failure | Fail class | See description of fail classes | | |

If the engine has not stopped within the delay time, outputs A and B will activate and a *stop failure* alarm occurs.

**4600 V-belt/RPM input failure**

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 4601 | V-belt (P3) | Timer | 0.0 s | 10.0 s | 1.0 s |
| 4602 | V-belt | Relay output A | R0 (none) | R26 (relay 26) | R0 (none) |
| 4603 | V-belt | Relay output B | R0 (none) | R26 (relay 26) | R0 (none) |
| 4604 | V-belt | Enable | OFF | ON | OFF |
| 4605 | V-belt | Fail class | See description of fail classes | | |

**The V-belt failure is used on air-cooled engines to monitor that the V-belt driven cooling fan is operating properly. This alarm requires W input to be used in parallel with another running feedback at the same time. The status of both will be compared. If they do not match, a V-belt alarm will be activated.**

**4610 Charger gen.**

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 4611 | Charger gen. (P3) | Timer | 0.0 s | 60.0 s | 0.2 s |
| 4612 | Charger gen. | Relay output A | R0 (none) | R26 (relay 26) | R0 (none) |
| 4613 | Charger gen. | Relay output B | R0 (none) | R26 (relay 26) | R0 (none) |
| 4614 | Charger gen. | Enable | OFF | ON | OFF |
| 4615 | Charger gen. | Fail class | See description of fail classes | | |

**This alarm requires D+ input to be used in parallel with another running feedback at the same time (binary input, tacho, generator voltage). The status of both will be compared. If they do not match, a charger gen. alarm will be activated.**

### 4620 RMI fuel level input 1.3

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 4621 | Fuel level 1.3 (P3) | Set point | 0 % | 100 % | 80 % |
| 4622 | Fuel level 1.3 (P3) | Delay | 0.0 s | 100.0 s | 5.0 s |
| 4623 | Fuel level 1.3 | Output A | R0 (none) | R26 (relay 26) | R0 (none) |
| 4624 | Fuel level 1.3 | Output B | R0 (none) | R26 (relay 26) | R0 (none) |
| 4625 | Fuel level 1.3 | Enable | OFF | ON | OFF |
| 4626 | Fuel level 1.3 | Fail class | See description of fail classes | | |

### 4950 Battery low 2

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 4951 | Battery low 2 | Set point | 6.0V | 36.0V | 15.0V |
| 4952 | Battery low 2 | Timer | 0.0 s | 999.0 s | 1.0 s |
| 4953 | Battery low 2 | Relay output A | R0 (none) | R26 (relay 26) | R0 (none) |
| 4954 | Battery low 2 | Relay output B | R0 (none) | R26 (relay 26) | R0 (none) |
| 4955 | Battery low 2 | Enable | OFF | ON | ON |

### 4960 Battery low 1

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 4961 | Battery low V* | Set point | 6.0V | 36.0V | 18.0V |
| 4962 | Battery low V* | Timer | 0.0 s | 999.0 s | 1.0 s |
| 4963 | Battery low V | Relay output A | R0 (none) | R26 (relay 26) | R0 (none) |
| 4964 | Battery low V | Relay output B | R0 (none) | R26 (relay 26) | R0 (none) |
| 4965 | Battery low V | Enable | OFF | ON | ON |

### 4970 Battery high voltage

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 4971 | Battery high V* | Set point | 12.0V | 40.0V | 28.0V |
| 4972 | Battery high V* | Timer | 0.0 s | 10.0 s | 1.0 s |
| 4973 | Battery high V | Relay output A | R0 (none) | R26 (relay 26) | R0 (none) |
| 4974 | Battery high V | Relay output B | R0 (none) | R26 (relay 26) | R0 (none) |
| 4975 | Battery high V | Enable | OFF | ON | OFF |

### 5000...5060 Relay functions

| No. | Setting | | First/min. setting | Second/max. setting | Factory setting |
|---|---|---|---|---|---|
| 50X1 | Relay X | Function | Alarm | Limit | Alarm |
| 50X2 | Relay X | Off delay | 0.0 s | 999.9 s | 5.0 s |

**If option B3 is present, then parameters 5050 and 5060 are not available.**

### 5110 Relay function

| No. | Setting | | First/min. setting | Second/max. setting | Factory setting |
|---|---|---|---|---|---|
| 5111 | Relay 3 | Function | Alarm | Limit | Alarm |
| 5112 | Relay 3 | Off delay | 0.0 s | 999.9 s | 5.0 s |

**Relay 3 can be used for “Status Ok” or as configurable relay. Only HW 1.05.**

### Alarm/limit function of relays

Alarm relay function: When an alarm activates the relay, it is activated as long as the alarm is present and unacknowledged. If the off delay is set different from 0.0 s, a short reset of the relay will take place when a new alarm appears.

Limit function: When an input activates the relay, no alarm message is displayed. After the condition activating this relay has returned to normal, the relay will deactivate when the off delay has expired.

**Relays used in M-Logic strings must be set to limit function to work correctly.**

### 6000 Nominal settings 1

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 6001 | Nominal settings 1 | Frequency | 48.0 Hz | 62.0 Hz | 50.0 Hz |
| 6002 | Nominal settings 1 | Generator power | 4 kW | 20000 kW | 480 kW |
| 6003 | Nominal settings 1 | Generator current | 0 A | 9000 A | 787 A |
| 6004 | Nominal settings 1 | Generator volt. | 50 V | 25000 V | 400 V |
| 6005 | Nominal settings 1 | Nom. RPM 1 | 0 RPM | 4000 RPM | 1500 RPM |
| 6006 | Nominal settings | Set | | | |

**Which set of nominal settings is used can be chosen in parameter 6006.**

### 6010 Nominal settings 2

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 6011 | Nominal settings 2 | Frequency | 48.0 Hz | 62.0 Hz | 50.0 Hz |
| 6012 | Nominal settings 2 | Generator power | 4 kW | 20000 kW | 480 kW |
| 6013 | Nominal settings 2 | Generator current | 0 A | 9000 A | 787 A |
| 6014 | Nominal settings 2 | Generator volt. | 50 V | 25000 V | 400 V |
| 6015 | Nominal settings 2 | Nom. RPM 2 | 0 RPM | 4000 RPM | 1500 RPM |

**The voltage set in nominal settings 1 and 2 is phase-to-phase values.**

### 6020 Nominal settings 3 (1 ph)

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 6021 | Nominal settings 3 | Frequency | 48.0 Hz | 62.0 Hz | 50.0 Hz |
| 6022 | Nominal settings 3 | Generator power | 4 kW | 20000 kW | 480 kW |
| 6023 | Nominal settings 3 | Generator current | 0 A | 9000 A | 787 A |
| 6024 | Nominal settings 3 | Generator volt. | 50 V | 25000 V | 230 V |
| 6025 | Nominal settings 3 | Nom. RPM 3 | 0 RPM | 4000 RPM | 1500 RPM |

### 6030 Nominal settings 4 (split ph)

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 6031 | Nominal settings 4 | Frequency | 48.0 Hz | 62.0 Hz | 50.0 Hz |
| 6032 | Nominal settings 4 | Generator power | 4 kW | 20000 kW | 480 kW |
| 6033 | Nominal settings 4 | Generator current | 0 A | 9000 A | 787 A |
| 6034 | Nominal settings 4 | Generator volt. | 50 V | 25000 V | 400 V |
| 6035 | Nominal settings 4 | Nom. RPM 4 | 0 RPM | 4000 RPM | 1500 RPM |

**Each nominal setting can be selected by parameter 6006, M-Logic or by external communication.**

**The voltage set in nominal settings 4 is phase (L1) to phase (L2) values.**

### 6040 Transformer generator

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 6041 | Transformer gen. | Primary | 50 V | 25000 V | 440 V |
| 6042 | Transformer gen. | Secondary | 50 V | 480 V | 440 V |
| 6043 | Transformer gen. | Current prim. | 5 A | 9000 A | 1000 A |
| 6045 | Transformer gen. | Current sec. | 1 A | 5 A | 5 A |

### 6050 Transformer mains

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 6051 | Transformer mains | Primary | 50 V | 25000 V | 440 V |
| 6052 | Transformer mains | Secondary | 50 V | 480 V | 440 V |

**If no voltage transformer is used, the setting 440/440 V can be maintained.**

**Transformer settings are ph-ph values, also when nominal settings 3 (1ph) is selected.**

### 6070 Genset mode

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 6071 | Genset mode | Set point | Island | Load takeover | Island |

### 6080 Language

| No. | | | Setting | Factory setting |
|---|---|---|---|---|
| 6081 | Language | English | Master | Master |
| 6082 | Language | Selectable* | No. 1 | |
| 6083 | Language | Selectable* | No. 2 | |
| 6084 | Language | Selectable* | No. 3 | |
| 6085 | Language | Selectable | No. 4 | Customer translation |
| 6086 | Language | Selectable | No. 5 | Customer translation |
| 6087 | Language | Selectable | No. 6 | Customer translation |
| 6088 | Language | Selectable | No. 7 | Customer translation |
| 6089 | Language | Selectable | No. 8 | Customer translation |
| 6090 | Language | Selectable | No. 9 | Customer translation |
| 6091 | Language | Selectable | No. 10 | Customer translation |
| 6092 | Language | Selectable | No. 11 | Customer translation |

*See chapter regarding language selection.

**The date and time can easily be synchronised with the laptop using the utility software, or changed manually via display.**

### 6100 Counter

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 6101 | Counter* | Running, hours | 0 | 32000 | 0 |
| 6103 | Counter* | GB operations | 0 | 32000 | 0 |
| 6104 | Counter* | MB operations | 0 | 32000 | 0 |
| 6105 | Counter* | Reset counter kWh | OFF | ON | OFF |

### 6110 Service timer 1

| No. | Setting | | Min. setting | Second setting | Max. setting | Factory setting |
|---|---|---|---|---|---|---|
| 6111 | Service timer 1 | Type | OFF | Counting down | Counting up | OFF |
| 6112 | Service timer 1* | Set point hours | 1 | | 32000 | 150 |
| 6113 | Service timer 1* | Set point days | 1 | | 1000 | 365 |
| 6114 | Service timer 1 | Fail class | See description of fail classes | | | |
| 6115 | Service timer 1 | Output A | Relay 0 | | Relay 5 | Relay 0 |
| 6116 | Service timer 1* | Reset | OFF | | ON | OFF |

### 6120 Service timer 2

| No. | Setting | | Min. setting | Second setting | Max. setting | Factory setting |
|---|---|---|---|---|---|---|
| 6121 | Service timer 2 | Type | OFF | Counting down | Counting up | OFF |
| 6122 | Service timer 2* | Set point hours | 1 | | 32000 | 150 |
| 6123 | Service timer 2* | Set point days | 1 | | 1000 | 365 |
| 6124 | Service timer 2 | Fail class | See description of fail classes | | | |
| 6125 | Service timer 2 | Output A | Relay 0 | | Relay 5 | Relay 0 |
| 6126 | Service timer 2* | Reset | OFF | | ON | OFF |

### 6130 Alarm horn

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 6131 | Alarm horn* | Timer | 0.0 s | 990.0 s | 20.0 s |
| | | | | | |
| | | | | | |

According to factory setting, the horn output will activate for 20 seconds when an alarm appears. If the timer setting is adjusted to 0, the horn relay will be activated continuously, until the reset alarm horn push-button is activated or the alarm is acknowledged.

### 6160 Run status

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 6161 | Run status | Timer | 0.0 s | 60.0 s | 5.0 s |
| 6162 | Run status | Relay output A | R0 (none) | R26 (relay 26) | R0 (none) |
| 6163 | Run status | Relay output B | R0 (none) | R26 (relay 26) | R0 (none) |
| 6164 | Run status | Enable | OFF | ON | OFF |

The running status detection has two purposes:

1. When the time delay period expires, all the alarms which have Enable selected to “Not run status” will be activated.

2. An output relay can be selected, if one is available. In that case, the settings output A and output B must be set according to the desired relay. To avoid an unwanted display alarm, “RUN STATUS ALARM”, the function of this relay must be selected to “Limit” function to avoid the alarm when the engine starts. Notice that both output A and output B must have the same settings, when the function of the relay is set only as limit switch.

**6170 Tacho config.**

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 6173 | Tacho config. | Set point | 0 RPM | 4000 RPM | 400 RPM |
| 6171 | Tacho config. | Number of teeth | 0 teeth | 500 teeth | 0 teeth |

**The tacho config. set point is used to deactivate the start relay. The number of teeth is used to configure the tacho input. The tacho input must be configured to 0 teeth when not in use. The tacho input accepts magnetic pickup (direct connection) or NPN/PNP/charger generator W input. Refer to functional description for information. Note that the frequency range for the tacho input is 10 Hz to 10000 Hz.**

**The * indicates parameters that can be changed via the push-buttons/display.**

**6180 Starter**

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 6181 | Starter (P1) | Start prepare | 0.0 s | 600.0 s | 5.0 s |
| 6183 | Starter (P1) | Start ON time | 1.0 s | 180.0 s | 5.0 s |
| 6184 | Starter (P1) | Start OFF time | 1.0 s | 99.0 s | 5.0 s |

**The settings “start prepare”, “start ON time” and “start OFF time” are the periods in which the start relay is activated.**

**The start prepare output can for example be used for pre-lubrication or pre-heating. The start relay output is for activating the engine starter. The start sequence can be activated manually by pressing the “START” push-button in local (hand) mode.**

**If no output relay has been chosen as starter relay, the start and stop sequences (cooling down) will be ignored, and the GC-1F will only operate as a safety stop device.**

**6190 Start attempts**

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 6191 | Start attempts | Attempts | 1 | 10 | 3 |
| 6192 | Start attempts | Relay output A | R0 (none) | R26 (relay 26) | R0 (none) |
| 6193 | Start attempts | Relay output B | R0 (none) | R26 (relay 26) | R0 (none) |

**6210 Run/stop (cooling down)**

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 6211 | Run/stop (P1) | Cooling down time | 0.0 s | 999.0 s | 240.0 s |
| 6212 | Run/stop (P1) | Extended STOP | 1.0 s | 99.0 s | 5.0 s |
| 6213 | Cool. down temp. | Cool down temp. | 0 °C | 302 °C | 70 °C |
| 6214 | Reference | Input for temp. ref. | RMI 3 | EIC | RMI 3 |

## Hz/V monitoring settings

### 6220 Hz/V OK

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 6221 | Hz/V OK* | Timer | 1.0 s | 99.0 s | 5.0 s |
| 6222 | Hz/V OK* | Voltage | 1 % | 70 % | 10 % |
| 6223 | Hz/V OK* | Frequency | 1 Hz | 20 Hz | 5 Hz |

**The setting ranges refer to nominal setting (nominal voltage +/- setting %, nominal frequency +/- setting Hz).**

### 6230 GB close delay

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 6231 | GB close delay | Timer | 0.0 s | 30.0 s | 0.5 s |

### 6233 GB pulse ON time

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 6234 | GB pulse ON time | Timer | 0.1 s | 10.0 s | 0.5 s |

### 6290 Idle mode

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 6291 | Idle mode | Enable | OFF | ON | OFF |
| 6292 | Idle mode | Timer | 1.0 s | 300.0 s | 5.0 s |
| 6293 | Idle mode | Active | Man. | Man./aut. | Aut. |
| | | | | | |

Idle mode can be controlled via a binary input. If this is selected, the idle mode remains as long as the input is ON. If a binary input is not used, the idle mode can be selected to be active for manual or auto or both running modes.

- Both manual and auto: Select Man./Auto
- Manual only: Select Man.
- Auto only: Select Auto

### 6320 Engine heater on

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 6321 | External heater on | Set point | 0 C/F | 100 C/F | 10 C/F |

### 6330 Engine heater off

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 6331 | External heater off | Set point | 0 C/F | 100 C/F | 20 C/F |

**In order to make the external heater function work, a relay must be designated to this function in the output settings.**

### 6350 D+ input

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 6351 | D+ input (P3) | Timer | 0.0 s | 100.0 s | 10.0 s |
| 6352 | D+ input | Relay output A | R0 (none) | R26 (relay 26) | R0 (none) |
| 6353 | D+ input | Enable | OFF | ON | OFF |
| 6354 | D+ input | NO/NC | NO | NC | NO |

**If the D+ input is selected to be ON, this will be used as a running feedback. The D+ output from the charge generator must be connected to the input terminal configured to this function. The terminal 9 (common for terminals 10 to 15) must be connected to +, otherwise the D+ input does not work.**

### 6360 GB on water temp.

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 6361 | GB on water temp. | Set point | 0 C/F | 100 C/F | 40 C/F |
| 6362 | GB on water temp. | Enable | OFF | ON | OFF |

### 6550 Fuel pump logic

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 6551 | Fuel pump logic (P3) | Set point 1 | 0 % | 100 % | 20 % |
| 6552 | Fuel pump logic (P3) | Set point 2 | 0 % | 100 % | 90 % |
| 6553 | Fuel pump logic (P3) | Timer | 0.1 s | 300.0 s | 60.0 s |
| 6554 | Fuel pump logic | Enable | OFF | ON | OFF |

**A relay must be configured to fuel pump in output settings.**

**10980 Config. input 1 must be set to RMI to activate the fuel pump logic.**

### 6560 Cool-down timeout

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 6561 | Cool-down timeout | Timer | 0.0 s | 9999.0 s | 900.0 s |
| 6562 | Cool-down timeout | Relay output A | R0 (none) | R26 (relay 26) | R0 (none) |
| 6563 | Cool-down timeout | Relay output B | R0 (none) | R26 (relay 26) | R0 (none) |

### 6570 Oil press. run detection

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 6571 | Oil press. run detection | Set point | 0 bar/PSI | 150 bar/PSI | 1 bar/PSI |
| 6572 | Oil press. run detection | Enable | OFF | ON | OFF |

**Parameter 6570 Oil pres. run detection makes it possible to use the oil pressure as a running feedback.**

### 6700 Diode compensation

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 6700 | Diode compensation | Set point | 0 V | 1 V | 0 V |

**The parameter 6700 can add an offset to the supply voltage measurement displayed. This can be useful, if a diode is mounted in the supply connection.**

### 6940 Alarm LED function

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 6941 | Alarm LED function | Customer | Red/red (Warning/ shutdown) | Amber/red (Warning/ shutdown) | Red/red (Warning/ shutdown) |

### 6950 Parameter group 1

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 6950 | Parameter group 1 | Enable | OFF | ON | OFF |

### 6960 Parameter group 2

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 6960 | Parameter group 2 | Enable | OFF | ON | OFF |

### 6970 Parameter group 3

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 6970 | Parameter group 3 | Enable | OFF | ON | OFF |

**If a parameter list is enabled, the parameters marked (PX) are available in the display parameter list.**

### 6980 Sleep mode

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 6981 | Sleep | Timer | 0 sec. | 1800 sec. | 600 sec. |
| 6982 | Sleep | ON | - | ON | ON |

The sleep mode is a standstill power saving mode. If the engine is stopped and nothing has happened within the time setting, the unit will enter sleep mode, that is the most power consuming functions (for example display) are turned off. As soon as an event occurs (a button is activated, the input state changes), the sleep mode is ended. If any unacknowledged alarms are present, the controller will never enter sleep mode.
It is not possible to disable sleep mode.

### 7040 AMF test function

| No. | Setting | | Min. setting | Second setting | Max. setting | Factory setting |
|---|---|---|---|---|---|---|
| 7042 | Activation | Set point | Digital input | Button | Digital input or button | Button |
| 7041 | Timer | Timer | 0.0 s | - | 3200.0 s | 30.0 s |
| 7043 | Enable | Enable | OFF | - | ON | ON |

### 7060 Mains failure voltage

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 7063* | Mains failure U low | Set point | 80 % | 100 % | 92 % |
| 7061* | Mains failure | Timer | 1.0 s | 990.0 s | 5.0 s |
| 7064* | Mains failure U high | Set point | 100 % | 120 % | 103 % |

### 7062 Mains OK voltage

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 7062* | Mains OK U | Timer | 1.0 s | 9900.0 s | 60.0 s |

### 7065 Mains failure control

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 7065 | Mains failure control | | Start eng. + open MB | Start eng. | Start eng. + open MB |

### 7070 Mains failure frequency

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 7073 | Mains failure f low* | Set point | 80 % | 100 % | 97 % |
| 7071 | Mains failure* | Timer | 1.0 s | 990.0 s | 5.0 s |
| 7074 | Mains failure f high* | Set point | 100 % | 120 % | 103 % |

### 7072 Mains OK frequency

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 7072 | Mains OK f* | Timer | 1.0 s | 9900.0 s | 60.0 s |

### 7080 MB close delay

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 7082 | MB close delay | Timer | 0.0 s | 30.0 s | 0.5 s |

### 7083 MB pulse ON time

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 7084 | MB pulse ON time | Timer | 0.1 s | 10.0 s | 0.5 s |

### 7090 Island test function

| No. | Setting | | Min. setting | Second setting | Max. setting | Factory setting |
|---|---|---|---|---|---|---|
| 7091 | Activation | Set point | Digital input | Button | Digital input or button | Button |
| 7092 | Timer | Timer | 0.0 s | - | 3200.0 s | 30.0 s |
| 7093 | Enable | Enable | OFF | - | ON | ON |

### 7110 Mains failure voltage unbalance

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 7110 | Mains failure unbalance | Enable | OFF | ON | OFF |
| 7111 | Mains unbalance failure | Timer | 1.0 s | 990.0 s | 5.0 s |
| 7112 | Mains unbalance OK | Timer | 10.0 s | 990.0 s | 60.0 s |
| 7114 | Mains unbalance volt. | Set point | 0 % | 50 % | 5 % |

### 7510 Modbus comm. settings

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 7511 | Modbus comm. | ID | 1 | 247 | 1 |
| 7512 | Modbus comm. | Speed | 9600 Baud | 19200 Baud | 9600 Baud |
| 7513 | Modbus comm. | Mode | RTU | ASCII | RTU |

### 7520 Modbus comm. error

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

**Menu 7562 is only used when MTU ADEC is selected as engine type.**

### 7560 Engine I/F

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 7561 | Engine I/F | Engine type | OFF<br>DDEC<br>EMR<br>JDEC<br>Iveco<br>Perkins<br>Caterpillar<br>Volvo Penta EMS<br>Volvo Penta EMS 2<br>Scania EMS<br>Scania EMS S6<br>MDEC 2000/4000 M.302<br>MDEC 2000/4000 M.303<br>MTU ADEC<br>Cummins CM850<br>Generic J1939 | | OFF |
| 7562 | Engine I/F | Node CANopen ID | 1 | 128 | 6 |
| 7563 | Engine I/F | EIC Controls | ON | OFF | ON |
| 7564 | Engine I/F | EIC Auto View | ON | OFF | ON |

### 7570 EIC comm. error

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 7571 | EI comm. error | Delay | 0.0 s | 100.0 s | 0.0 s |
| 7572 | EI comm. error | Relay output A | Not used | Option-dependent | Not used |
| 7573 | EI comm. error | Relay output B | Not used | | Not used |
| 7574 | EI comm. error | Enable | OFF | ON | OFF |
| 7575 | EI comm. error | Fail class | ML-2 unit dependent | | Warning |

**Choose MDEC 2000/4000 M.303 when M.201 or M.304 is required.**

### 7580 EIC warning

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 7581 | EIC warning | Delay | 0.0 s | 100.0 s | 0.0 s |
| 7582 | EIC warning | Relay output A | Not used | Option-dependent | Not used |
| 7583 | EIC warning | Relay output B | Not used | | Not used |
| 7584 | EIC warning | Enable | OFF | ON | OFF |
| 7585 | EIC warning | Fail class | ML-2 unit dependent | | Warning |

### 7590 EIC shutdown

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 7591 | EIC shutdown | Delay | 0.0 s | 100.0 s | 0.0 s |
| 7592 | EIC shutdown | Relay output A | Not used | Option-dependent | Not used |
| 7593 | EIC shutdown | Relay output B | Not used | | Not used |
| 7594 | EIC shutdown | Enable | OFF | ON | OFF |
| 7595 | EIC shutdown | Fail class | ML-2 unit dependent | | Shutdown |

### 7600 EIC overspeed

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 7601 | EIC overspeed | Set point | 0 % | 400 % | 110 % |
| 7602 | EIC overspeed | Delay | 0.0 s | 100.0 s | 2.0 s |
| 7603 | EIC overspeed | Relay output A | Not used | Option-dependent | Not used |
| 7604 | EIC overspeed | Relay output B | Not used | | Not used |
| 7605 | EIC overspeed | Enable | OFF | ON | OFF |
| 7606 | EIC overspeed | Fail class | ML-2 unit dependent | | Warning |

### 7610 EIC coolant t. 1

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 7611 | EIC coolant t. 1 | Set point | -40 deg. | 210 deg. | 100 deg. |
| 7612 | EIC coolant t. 1 | Delay | 0.0 s | 100.0 s | 5.0 s |
| 7613 | EIC coolant t. 1 | Relay output A | Not used | Option-dependent | Not used |
| 7614 | EIC coolant t. 1 | Relay output B | Not used | | Not used |
| 7615 | EIC coolant t. 1 | Enable | OFF | ON | OFF |
| 7616 | EIC coolant t. 1 | Fail class | ML-2 unit dependent | | Warning |

### 7620 EIC coolant t. 2

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 7621 | EIC coolant t. 2 | Set point | -40 deg. | 210 deg. | 110 deg. |
| 7622 | EIC coolant t. 2 | Delay | 0.0 s | 100.0 s | 5.0 s |
| 7623 | EIC coolant t. 2 | Relay output A | Not used | Option-dependent | Not used |
| 7624 | EIC coolant t. 2 | Relay output B | Not used | | Not used |
| 7625 | EIC coolant t. 2 | Enable | OFF | ON | OFF |
| 7626 | EIC coolant t. 2 | Fail class | ML-2 unit dependent | | Warning |

### 7630 EIC oil press. 1

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 7631 | EIC oil press. 1 | Set point | 0.0 bar | 10.0 bar | 2.0 bar |
| 7632 | EIC oil press. 1 | Delay | 0.0 s | 100.0 s | 5.0 s |
| 7633 | EIC oil press. 1 | Relay output A | Not used | Option-dependent | Not used |
| 7634 | EIC oil press. 1 | Relay output B | Not used | | Not used |
| 7635 | EIC oil press. 1 | Enable | OFF | ON | OFF |
| 7636 | EIC oil press. 1 | Fail class | ML-2 unit dependent | | Warning |

### 7640 EIC oil press. 2

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 7641 | EIC oil press. 2 | Set point | 0.0 bar | 10.0 bar | 1.0 bar |
| 7642 | EIC oil press. 2 | Delay | 0.0 s | 100.0 s | 5.0 s |
| 7643 | EIC oil press. 2 | Relay output A | Not used | Option-dependent | Not used |
| 7644 | EIC oil press. 2 | Relay output B | Not used | | Not used |
| 7645 | EIC oil press. 2 | Enable | OFF | ON | OFF |
| 7646 | EIC oil press. 2 | Fail class | ML-2 unit dependent | | Warning |

### 7650 EIC oil temp. 1

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 7651 | EIC oil temp. 1 | Set point | 0 °C | 300 °C | 40 °C |
| 7652 | EIC oil temp. 1 | Delay | 0.0 s | 100.0 s | 5.0 s |
| 7653 | EIC oil temp. 1 | Relay output A | Not used | Option-dependent | Not used |
| 7654 | EIC oil temp. 1 | Relay output B | Not used | | Not used |
| 7655 | EIC oil temp. 1 | Enable | OFF | ON | OFF |
| 7656 | EIC oil temp. 1 | Fail class | ML-2 unit dependent | | Warning |

### 7660 EIC oil temp. 2

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 7661 | EIC oil temp. 2 | Set point | 0 °C | 300 °C | 40 °C |
| 7662 | EIC oil temp. 2 | Delay | 0.0 s | 100.0 s | 5.0 s |
| 7663 | EIC oil temp. 2 | Relay output A | Not used | Option-dependent | Not used |
| 7664 | EIC oil temp. 2 | Relay output B | Not used | | Not used |
| 7665 | EIC oil temp. 2 | Enable | OFF | ON | OFF |
| 7666 | EIC oil temp. 2 | Fail class | ML-2 unit dependent | | Warning |

## Communication setup

### 7940 CAN2 comm. error

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 7941 | CAN2 comm. error | Delay | 2.0 s | 600.0 s | 10.0 s |
| 7942 | CAN2 comm. error | Relay output A | Not used | Option-dependent | R0 (none) |
| 7943 | CAN2 comm. error | Relay output B | Not used | | R0 (none) |
| 7944 | CAN2 comm. error | Enable | OFF | ON | OFF |

### 7980 CAN 2

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 7983 | CAN 2 | ID | 10 | 64 | 1 |
| 7984 | CAN 2 | Reset | NO | YES | NO |

**Menu 7984 is for re-establishing communication after a fault/disconnection.**

**After changing type, the parameter list in the PC USW must be uploaded again.**

### 7950 KL320x config.

| No. | Setting | | Type | Factory setting |
|---|---|---|---|---|
| 7951 | KL320x config. | Module 1 | Pt100 (2/3-wire)<br>Pt1000 (2/3-wire)<br>10-3200 Ω (2-wire)<br>10-1200 Ω (2-wire) | Pt100 (2/3-wire) |
| 7952 | KL320x config. | Module 2 | | |
| 7953 | KL320x config. | Module 3 | | |
| 7954 | KL320x config. | Module 4 | | |

**The above selections for KL 3202/3204 cannot be changed.**

**After changing module type, the parameter list in the PC USW must be uploaded again.**

### 9110 Password

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 9116 | Password | Customer | 0 | 9999 | 2000 |
| 9117 | Password | Service | 0 | 9999 | 2001 |

### User password

If you forget the password, contact DEIF Support for details.

### 9210 Setup norms

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 9211 | Setup norms | Service | None selected | VDE notstrom | None selected |

### 10000 Cmd.1 timer/start/stop

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 10001 | Cmd.1 timer/start/stop | Set point | Timer M-Logic | Stop | Timer M-Logic |
| 10002 | Cmd.1 timer/start/stop | Enable | OFF | ON | OFF |

### 10010 Cmd.1 day(s)

| No. | Setting | Setting | Factory setting |
|---|---|---|---|
| 10010 | Cmd.1 day(s) | MO | |
| | | TU | |
| | | WE | |
| | | TH | |
| | | FR | |
| | | SA | |
| | | SU | |
| | | MO-TU-WE-TH | |
| | | MO-TU-WE-TH-FR | |
| | | SA-SU | |
| | | MO-TU-WE-TH-FR-SA-SU | X |

### 10020 Cmd.1 hour

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 10020 | Cmd.1 | Hour | 0 | 23 | 10 |

### 10030 Cmd.1 min

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 10030 | Cmd.1 | Min. | 0 | 59 | 0 |

**Same structure is repeated for days 2 to 8, settings 10040 to 10310.**

### 10320-10370 GSM pin code and dial-up numbers

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 10320 | GSM | GSM pin code | 0 | 9999 | 0 |
| 10331 | GSM | SMS telephone no. | 0 | +9999999999999 | +4512345678 |
| 10332 | GSM | Enable | OFF | ON | OFF |
| 10341 | GSM | SMS telephone no. | 0 | +9999999999999 | +4512345678 |
| 10342 | GSM | Enable | OFF | ON | OFF |
| 10351 | GSM | SMS telephone no. | 0 | +9999999999999 | +4512345678 |
| 10352 | GSM | Enable | OFF | ON | OFF |
| 10361 | GSM | SMS telephone no. | 0 | +9999999999999 | +4512345678 |
| 10362 | GSM | Enable | OFF | ON | OFF |
| 10371 | GSM | SMS telephone no. | 0 | +9999999999999 | +4512345678 |
| 10372 | GSM | Enable | OFF | ON | OFF |

**A telephone number set to 0 means not used. The prefix + and country code must always be entered. For example +45 for Denmark.**

### 10460-10620 Fuel level config. sensor

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 10460 | Fuel level type | Type | 1 | 3 | 1 |
| 10470 | RMI 1 | Fuel level Input 1 | 0 ohm | 180 ohm | 0 ohm |
| 10480 | RMI 1 | Fuel level Output 1 | 0 % | 150 % | 40 % |
| 10490 | RMI 1 | Fuel level Input 2 | 0 ohm | 180 ohm | 40 ohm |
| 10500 | RMI 1 | Fuel level Output 2 | 0 % | 150 % | 50 % |
| 10510 | RMI 1 | Fuel level Input 3 | 0 ohm | 180 ohm | 50 ohm |
| 10520 | RMI 1 | Fuel level Output 3 | 0 % | 150 % | 60 % |
| 10530 | RMI 1 | Fuel level Input 4 | 0 ohm | 180 ohm | 60 ohm |
| 10540 | RMI 1 | Fuel level Output 4 | 0 % | 150 % | 80 % |
| 10550 | RMI 1 | Fuel level Input 5 | 0 ohm | 180 ohm | 70 ohm |
| 10560 | RMI 1 | Fuel level Output 5 | 0 % | 150 % | 100 % |
| 10570 | RMI 1 | Fuel level Input 6 | 0 ohm | 180 ohm | 80 ohm |
| 10580 | RMI 1 | Fuel level Output 6 | 0 % | 150 % | 110 % |
| 10590 | RMI 1 | Fuel level Input 7 | 0 ohm | 180 ohm | 90 ohm |
| 10600 | RMI 1 | Fuel level Output 7 | 0 % | 150 % | 90 % |
| 10610 | RMI 1 | Fuel level Input 8 | 0 ohm | 180 ohm | 100 ohm |
| 10620 | RMI 1 | Fuel level Output 8 | 0 % | 150 % | 120 % |

**HW 1.05 and SW 2.x.x have max. 2500 Ohm of all RMI sensors.**

### 10630-10790 Oil pressure config. sensor

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 10630 | Oil pressure type | Type | 1 | 4 | 1 |
| 10640 | RMI 2 | Oil pressure Input 1 | 0 ohm | 180 ohm | 30 ohm |
| 10650 | RMI 2 | Oil pressure Output 1 | 0.0 bar | 15.0 bar | 4.0 bar |
| 10660 | RMI 2 | Oil pressure Input 2 | 0 ohm | 180 ohm | 60 ohm |
| 10670 | RMI 2 | Oil pressure Output 2 | 0.0 bar | 15.0 bar | 5.0 bar |
| 10680 | RMI 2 | Oil pressure Input 3 | 0 ohm | 180 ohm | 90 ohm |
| 10690 | RMI 2 | Oil pressure Output 3 | 0.0 bar | 15.0 bar | 6.0 bar |
| 10700 | RMI 2 | Oil pressure Input 4 | 0 ohm | 180 ohm | 120 ohm |
| 10710 | RMI 2 | Oil pressure Output 4 | 0.0 bar | 15.0 bar | 8.0 bar |
| 10720 | RMI 2 | Oil pressure Input 5 | 0 ohm | 180 ohm | 150 ohm |
| 10730 | RMI 2 | Oil pressure Output 5 | 0.0 bar | 15.0 bar | 10.0 bar |
| 10740 | RMI 2 | Oil pressure Input 6 | 0 ohm | 180 ohm | 180 ohm |
| 10750 | RMI 2 | Oil pressure Output 6 | 0.0 bar | 15.0 bar | 11.0 bar |
| 10760 | RMI 2 | Oil pressure Input 7 | 0 ohm | 180 ohm | 210 ohm |
| 10770 | RMI 2 | Oil pressure Output 7 | 0.0 bar | 15.0 bar | 11.5 bar |
| 10780 | RMI 2 | Oil pressure Input 8 | 0 ohm | 180 ohm | 240 ohm |
| 10790 | RMI 2 | Oil pressure Output 8 | 0.0 bar | 15.0 bar | 15.0 bar |

**HW 1.05 and SW 2.x.x have max. 2500 Ohm of all RMI sensors.**

### 10800-10950 Water temp. config. sensor

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 10800 | RMI | Type | 1 | 5 | 1 |
| 10810 | RMI 3 | Water temp. Input 1 | 0 ohm | 2500 ohm | 0 ohm |
| 10820 | RMI 3 | Water temp. Output 1 | 0 | 150 | 0 °C |
| 10830 | RMI 3 | Water temp. Input 2 | 0 ohm | 2500 ohm | 40 ohm |
| 10840 | RMI 3 | Water temp. Output 2 | 0 | 150 | 40 °C |
| 10850 | RMI 3 | Water temp. Input 3 | 0 ohm | 2500 ohm | 60 ohm |
| 10860 | RMI 3 | Water temp. Output 3 | 0 | 150 | 60 °C |
| 10870 | RMI 3 | Water temp. Input 4 | 0 ohm | 2500 ohm | 80 ohm |
| 10880 | RMI 3 | Water temp. Output 4 | 0 | 150 | 80 °C |
| 10890 | RMI 3 | Water temp. Input 5 | 0 ohm | 2500 ohm | 90 ohm |
| 10900 | RMI 3 | Water temp. Output 5 | 0 | 150 | 90 °C |
| 10910 | RMI 3 | Water temp. Input 6 | 0 ohm | 2500 ohm | 100 ohm |
| 10920 | RMI 3 | Water temp. Output 6 | 0 | 150 | 100 °C |
| 10930 | RMI 3 | Water temp. Input 7 | 0 ohm | 2500 ohm | 120 ohm |
| 10940 | RMI 3 | Water temp. Output 7 | 0 | 150 | 120 °C |
| 10950 | RMI 3 | Water temp. Input 8 | 0 ohm | 2500 ohm | 150 ohm |
| 10960 | RMI 3 | Water temp. Output 8 | 0 | 150 | 150 °C |

### 10970-11000 Engineering units

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 10971 | Unit | Set point | C/bar | F/bar | C/bar |

### 10980 Configurable input selection

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 10980 | Conf inp 1 | Set point | RMI | Binary | RMI |
| 10990 | Conf inp 2 | Set point | RMI | Binary | RMI |
| 11000 | Conf inp 3 | Set point | RMI | Binary | RMI |

Possible selections:

- RMI
- 4 to 20 mA
- 0 to 20 mA
- Binary

# External I/O setup

## Analogue inputs

### 12000 Ext. an. in. 1.1

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 12000 | Ext. an. in. 1.1 | Set point | -20000 | 20000 | 10 |
| | | Delay | 2.0 s | 3200.0 s | 10.0 s |
| | | Fail class | See description of fail classes | | Warning |
| | | Relay output A | Not used | Option-dependent | Not used |
| | | Relay output B | Not used | | Not used |
| | | Enable | OFF | ON | OFF |

### 12010 Ext. an. in. 1.2

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 12010 | Ext. an. in. 1.2 | Set point | -20000 | 20000 | 10 |
| | | Delay | 2.0 s | 3200.0 s | 10.0 s |
| | | Fail class | See description of fail classes | | Warning |
| | | Relay output A | Not used | Option-dependent | Not used |
| | | Relay output B | Not used | | Not used |
| | | Enable | OFF | ON | OFF |

**Same order for settings 12030 to 12230.**

## Analogue outputs

**The GC-1F does not support analogue outputs.**

## Digital inputs

### 12540 Ext. dig. in 1

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 12540 | Ext. dig. in 1 | Delay | 2.0 s | 3200.0 s | 10.0 s |
| | | Fail class | See description of fail classes | | Warning |
| | | Relay output A | Not used | Option-dependent | Not used |
| | | Relay output B | Not used | | Not used |
| | | Enable | OFF | ON | OFF |

**Same order for settings 12560 to 12690.**

## Digital outputs

### 12790 Ext. dig. out 1

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 12790 | Ext. digital output 1 | Delay | 2.0 s | 3200.0 s | 10.0 s |
| | | Fail class | See description of fail classes | | Warning |
| | | Relay output A | Not used | Option-dependent | Not used |
| | | Relay output B | Not used | | Not used |
| | | Enable | OFF | ON | OFF |

**Same order for settings 12810 to 12940.**

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