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CGM96-SR INTRODUCTION (Network Supervisor)

The **CGM96-SR** is a controlling unit for Diesel Power Generators that enables the generator to be manually or automatically started. The **CGM96-SR** is equipped with 23 digital / analogue inputs to accomplish the appropriate controlling actions over the main mechanical parameters of combustion engines.

Through its built-in synoptic board the user can easily monitor, in real time, the status of the installation, as well as check if any type of alarm event has occurred, either due to any mechanical or electrical parameter failure.

Another remarkable point is the fact that the **CGM96-SR** continuously supervises the voltage and frequency values from the Network and the Generator, values obtained by **true RMS measuring method**, which is an indispensable method taking into account the increasingly use of non-linear loads within present industrial facilities. The measurement of electrical values, together with the monitoring of the mechanical parameters status, provide the necessary information to control the right operation of the Diesel Power Generator.

A basic setting of the controlling unit can be done by means of the frontal keyboard, but, since multiple parameters can be set in the **CGM96-SR** to appropriately fit its performance mode to our installation, an on-board communication port enables the interface to a PC in order to complete any kind of reading, saving, exporting and setting actions of all parameters, by means of a friendly-use software.

The **CGM96-SR** meets all Industrial Environment tests, has the C€ mark, and offers the maximum quality and reliability guaranties to the user.

TECHNICAL SPECIFICATIONS

Power supply

Supply voltage	7 ...40 V d.c.
Maximum burden	5 VA
Maximum idle burden	0.5 VA

Measuring circuits

Measuring resolution	10 bits
Samples per cycle	32
Measuring accuracy	+/-0.5 % F.S.
Temperature influence	0.015 %/ °C
Frequency measuring resolution	0.01 Hz
Measuring circuit insulation	
• Test voltage	3 kV r.m.s. 50 Hz 1min.
• Impulse test	4 kV (1,2 / 50 µs)

Output relay specifications

Rated current (A.C.)	8 A
Maximum current (A.C.)	10 A
Rated voltage	250 V a.c. 50 Hz
Maximum voltage (VDE 0435)	440 V a.c.
Switch-over rated power for resistive load	2000 VA
Insulation resistance (500 V)	> 10 ⁸ MΩ
Contact-coil insulation	6000 V a.c.
Contact-contact insulation	1000 V a.c.
Mechanical endurance	> 20 x 10 ⁶ operations
Electrical endurance	> 20 x 10 ⁶ operations at 5 A 35 V

Environmental conditions

Storage temperature	-40 / +70 °C
Working temperature	-10 / +65 °C

Constructive characteristics

Case material:	Self-extinguishable, ABS, anthracite grey
Weight:	350 g
Frontal:	IP54 (IP65 with protective frontal)
Terminals:	"Faston" type (designed against vibrations)

IEC 1010, IEC 664, IEC 348, EN 50081-2, EN 50082-2, EGSA Standards

SAFETY WARNINGS

Safety considerations

The **CGM96-SR** meets protection class I.

The case is not dangerous to tactile touching (isolating material).

This instrument has been designed and tested to meet IEC 348 standard, and is factory-shipped in proper functioning conditions.

The manual you hold in your hands contains information and warnings that the user should thoroughly respect in order to guarantee a proper operation of all of the instrument functions and keep its safety conditions.

INSTALLATION AND START-UP

Instrument installation

The instrument is for indoor use. It could be occasionally subjected to temperatures between +75 °C and -10 °C keeping its safety conditions.

The instrument must not be powered on and used until its final assembly on the control board.

Adjustment, element replacement and repairing actions

With the instrument powered on, the terminals could be dangerous to touching and cover opening actions may allow the access to dangerous parts. Therefore, before any adjustment, replacement, maintenance or repairing operation is carried out, the instrument must be completely disconnected from any power supply source.

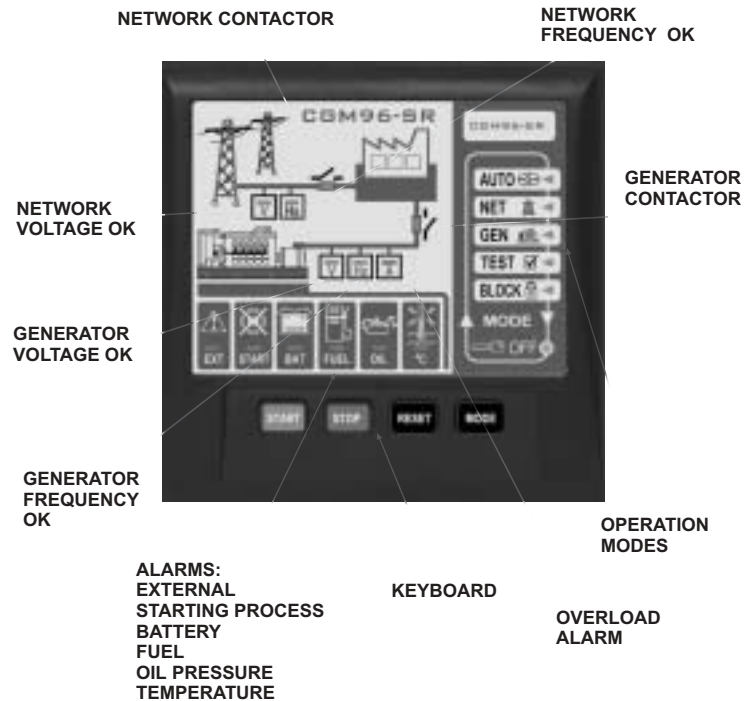
No adjustment, maintenance or repairing operation should be done over the instrument open and powered and, should those are essential, only high-qualified operators must perform them.

Defects and malfunction

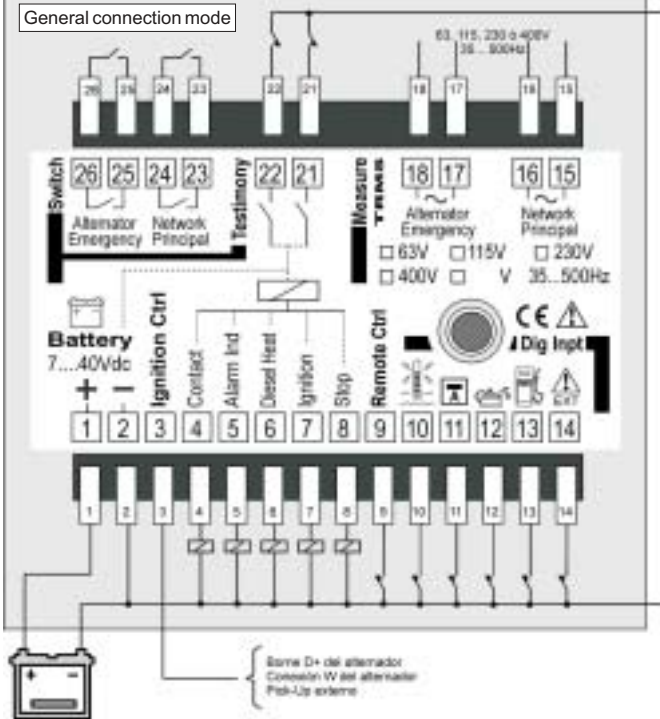
When any protection failure is suspected to exist, the instrument must be immediately put out of service. The protection could be damaged whether:

- ▶ You can see damages on the case
- ▶ It cannot perform proper measurements
- ▶ Storage conditions were not the suitable ones
- ▶ Any damage in transit occurred.

DISPLAY OF PARAMETERS



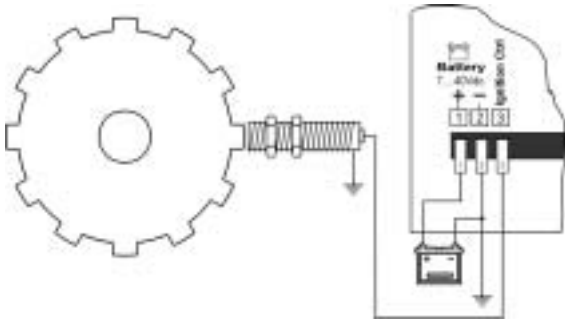
WIRING DIAGRAM



- 1 Battery positive terminal
- 2 Battery negative terminal
- 3 Engine ignition control
- 4 Contact
- 5 Alarm signaling
- 6 Diesel oil heater
- 7 Engine ignition
- 8 Stop
- 9 Remote control
- 10 Temperature alarm
- 11 Overload alarm
- 12 Oil pressure alarm
- 13 Fuel alarm
- 14 External alarm
- 15 / 16 Network voltage
- 17 / 18 Generator voltage
- 21 Network contactor confirmation signal
- 22 Generator contactor confirmation signal
- 23 / 24 Network contactor
- 25 / 26 Generator contactor

"Pick-Up" wiring mode

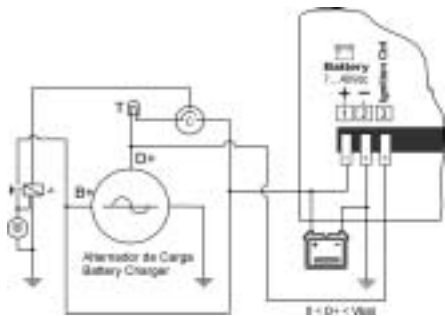
The **CGM96-SR** permits the control of the generator starting through an external Pick-Up. To execute this action, the **Ignition Ctrl** input must be then used, and the connection mode must be arranged as the below figure illustrates:



"Terminal D+" wiring mode

The **CGM96-SR** permits the control of the generator starting through the D.C. voltage that exists in some battery charger generators. This connection mode is commonly known as **"Terminal D+"**.

As you can view in the below drawing that shows the generator connection, the generator has three clearly differentiated terminals: ground, load output (**B+**) and output to the control board (**D+**).



The battery warning light (**T**) in the control board is equipped with two positive terminals, the positive coming from the generator **D+**, and the one coming from the contact terminal - **C** -, which is, naturally, taken from the battery.

When the generator is stopped this does not supply electric current, therefore, only the battery charge warning light will be grounded through the terminal **D+**.

This causes the warning light to light up: a voltage difference appears between the positive terminal of the warning light, that is connected to the terminal **15** of the contact, and the grounding point from **D+** in the generator.

Once the starting command is activated, the warning light positive current by itself acts as the generator excitation to start its charging process and, therefore, the generator will supply, through the terminal **D+**, a positive current with an equal level than the current received by the warning light from the contact terminal; consequently, no difference voltage will appear anymore and the warning light will put out.

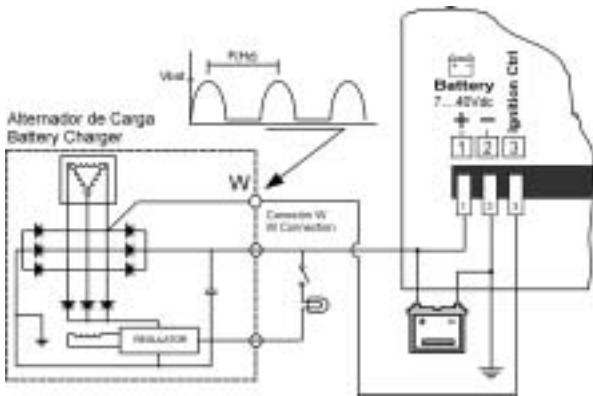
So, we can use the connection to the terminal **D+** to control the **engine starting process**. When the voltage taken at this terminal exceeds a preset level the starting condition is then fulfilled.

We must remark that in case that our system has no load (battery warning light), then, depending on the generator construction, maybe no positive voltage will appear at this terminal. To solve this situation, just insert a load between this terminal and the battery positive terminal (you can simply use a lamp).

"W connection" wiring mode

The generator starting process can also be controlled through the frequency of the signal that exists at one terminal of some battery charger generators. This connection is commonly known as **"W connection"** or **"Omega connection"**.

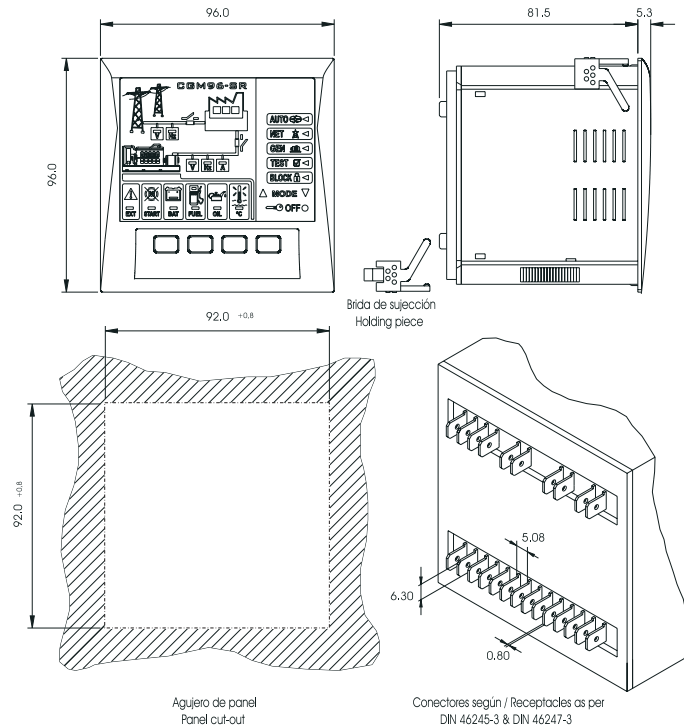
As you can view in the below drawing that shows the generator connection, the generator has three clearly differentiated terminals: ground, load output and W connection.



This connection takes the signal from the rectifying circuit, therefore, this signal has the shape of a rectified wave.

The wave level is approximately equal than the battery voltage value and its frequency will depend on the speed in rpm.

DIMENSIONS



Agujero de panel
Panel cut-out

Conectores según / Receptacles as per
DIN 46245-3 & DIN 46247-3

OPERATION MODES

The **CGM96-SR** provides 5 operation modes (plus an additional one for the stop process). The way to choose the required mode is explained in the "Keyboard Functions" Section.

AUTO 

Automatic mode. Under this operation mode, the device is continuously surveying the network status.

When the network values go out from the defined range (the minimum and maximum value of the voltage as well as the frequency range are user-programmable values) during a period longer than the fixed one, then an **alarm** event is happening.

At this moment the network contactor is switched off, unless the option "when available generator" has been selected. For this last case, the network contactor will be switched off just in the moment when the generator is ready for functioning. (This option is not really advisable since it is generally better to disconnect the network rather than to keep the loads supplied by improper values).

Then, the controlling unit starts the generator up and, as soon as that both voltage and frequency values are the proper ones, switches over the network contactor by the generator contactor.

When the network values are back again within the allowable limits and this situation is kept during an also user-programmable interval, then the generator contactor is switched over by the network contactor. The generator is then kept running in idle conditions during certain time, so that the engine can be properly cooled, and finally the stop sequence of the generator is completed.

Under this operation mode the **Remote Ctrl** input can be enabled, which will behave as follows: if the input is free (no connection) then the Auto mode will operate as previously described; if the input is connected to **+Vbat**, then any kind of automatic starting will be disabled and the generator will stop provided that this was running; if the input is connected to **-Vbat** (GND), then the generator will be turn on and the downstream loads will be supplied by the generator.

NET 

Network mode. Under this operation mode loads are exclusively supplied by the network. The instrument will survey all inputs as well as the network voltage and frequency, and, unless the option "when available generator" has been selected, if the network monitored values are out from the user-defined ranges, the network contactor will be switch off. When the network values are back again within the allowable limits and this situation is kept the user-programmable interval, then the network contactor will be switched on back.

GEN 

Generator mode. Under this operation mode, the user can force the generator starting just pressing the **START** push-button, and stop it by pressing the **STOP** push-button. When the generator is running, as soon as that both the voltage and frequency values are the proper ones, then the network contactor is switched over by the generator contactor.

TEST 

Test mode. Under this operation mode the user can carry a test of the system performance out, just by pressing the **START** push-button. So, the generator will be turn on, the voltage and frequency will be checked, and the switching-over operation of the contactors will be also completed. After 3 minutes, the generator will be turn off and the system will return back to the Network mode.

BLOCK 

Blocking mode. Operation mode suitable for maintenance works since no operation is executed, only the network and the generator conditions are viewed, as well as the control inputs.

OFF 

Disconnection. After a delay of 15 seconds, the controlling unit is turn off and keeps in low-consumption mode. By pressing the **START** push-button, the device is turn on in the **OFF** position, and then the desired operation mode can be reached by pressing the **MODE** push-button.

KEYBOARD FUNCTIONS

The **CGM96-SR** provides four push-buttons to execute diverse functions. In order to avoid accidental operations to happen, the push-button must be kept pressed during a minimum period of time before the associated action is effectuated. This period of time is about 2 to 3 s, excepts for the **BLOCK** mode exit which requires that the **MODE** push-button is pressed for at least 10 s.

START, STOP & RESET push-buttons.

The use of these push-buttons will depend on the active operation mode of the controlling unit.

Active mode	START push-button	STOP push-button	RESET push-button
AUTO	No effect	No effect	Delete Alarms
NET	No effect	No effect	Delete Alarms
GEN	Turn on generator	Turn off generator	Delete Alarms
TEST	Start Test	Stop Test	Delete Alarms
BLOCK	No effect	No effect	Delete Alarms
OFF	Turn on generator	No effect	No effect

MODE push-button.

This push-button permits the user to change the **CGM96-SR** operation mode.

When this push-button is pressed, the led of the present active mode starts blinking, and keeping it pressed, the other modes will be sequentially accessed and the associated led will blink. When the push-button is released, the led of the last accessed mode will accelerate its blinking cadence to notify that this operation mode is going to be established; and finally the blink will stop, which means that the new operation mode is totally enabled. That is, while any LED mode is blinking, the operation mode can be changed before the execution of any operation.

The operation mode change can be indistinctly done whether the generator is turned on or turned off.

If the generator is turned off when the operation mode is changed, then the new operation mode will be just established.

On the contrary, if the generator is turned on when the operation mode is changed, then the result will be defined by the new and former modes according to the below table:

Former mode	New selected mode	Operation that takes place before the new mode is completely established.
AUTO Turned on generator	NET	Turn off generator
	GEN	None
	TEST	Turn off generator
	BLOCK	Turn off generator
	OFF	Turn off generator
GEN Turned on generator	TEST	Turn off generator
	BLOCK	Turn off generator
	OFF	Turn off generator
	AUTO	If RC (+Vbat) then turn off generator
	NET	Turn off generator
TEST Turned on generator	BLOCK	Stopped generator
	OFF	Stopped generator
	AUTO	If RC (+Vbat) then turn off generator
	NET	Turn off generator
	GEN	None

STARTING PROCESS CONTROL

During the starting process of the generator, it becomes essential the control of the precise moment when this is completely started up, so that the starting command signal can be immediately cut; otherwise, a severe breakdown could happen if the starting command signal has not been cut in the correct moment.

The **CGM96-SR** enables five basic starting process controlling methods:

- 1) By means of an external **Pick-up**. The instrument measures the frequency transmitted by the Pick-Up and cuts the starting command signal when the preset value is reached (See "Pick-Up" wiring mode).
- 2) Through the **Terminal D+** in the battery charger generator. The instrument measures this D.C. value, and cuts the starting command signal when the preset value is reached (See "Terminal D+" connection mode).
- 3) Through the **W connection**. The instrument measures the frequency of the signal at the W terminal and cuts the starting command signal when the preset value is reached (See "W connection" wiring mode).
- 4) Through the **Generator frequency**. The instrument measures the frequency of the voltage supplied by the generator and cuts the starting command signal when the preset value is reached.
- 5) Through the **Oil pressure control**. The starting command signal is cut when the oil pressure is the adequate one.

Options 1,2 and 3 are executed through the **Ignition Ctrl** input, therefore, only one of them can be simultaneously chosen, that is, **one option excludes the other ones**.

The user can arrange AND - OR combinations with these five above controlling methods, which makes possible the definition of a wide range of controlling methods, from very basic ones (only oil pressure) to more complex combinations.

- OR:** For the OR type combinations, the fulfillment of one condition enables the action execution.
- AND:** For the AND type combinations, only the simultaneous fulfillment of all conditions enables the action execution.

Examples:

Example 1: In case that the starting command must signal be cut when the oil pressure is the adequate one or the voltage at the terminal D+ reaches the preset value, then the following sequence must be selected.

Oil pressure: OR type, and Terminal D+ voltage: OR type

Example 2: In case that the starting command signal must be cut when the oil pressure is the adequate one and the voltage at the terminal D+ reaches the preset value, then the following sequence must be selected.


Oil pressure: AND type, and Terminal D+ voltage: AND type


Example 3: In case that the starting command signal must be cut when the oil pressure is the adequate one or the generator frequency reaches the preset value and the voltage at the terminal D+ reaches the preset value, then the following sequence must be selected.


Oil pressure: OR type, Generator frequency: OR type, and Terminal D+ voltage: AND type


ALARMS


Following enumerated alarms protect the generator during its operation:

 **Alarm due to out-of-range voltage.** This protection acts when the voltage at the output of the generator is out of the allowable limits during a period of time higher than the user-programmed one. Before this situation, the generator contactor will be switched off, a full cooling stop process will be completed, the siren will be activated and the **V** icon will blink.

 **Alarm due to out-of-range frequency.** This protection acts when the frequency of the voltage at the output of the generator is out of the allowable limits during a period of time higher than the user-programmed one. Before this situation, the generator contactor will be switched off, a full cooling stop process will be completed, the siren will be activated and the **Hz** icon will blink.

 **Alarm due to engine fuel level.** This protection acts when the engine fuel level falls under a user-programmed value. Actions to be taken before this situation are user-programmable (see *Alarms with user-programmable actions*). The **Fuel** icon will blink.

 **Alarm due to low oil pressure.** This protection acts when the oil pressure falls under a user-programmed value. To enable this alarm any kind of pressure sensor, able to switch from ON/OFF status if a certain measured value is detected, is required. Actions to be taken before this situation are user-programmable (see *Alarms with user-programmable actions*). The **Oil** icon will blink.

 **Alarm due to high temperature.** This protection acts when the engine temperature exceeds a user-programmed value. To enable this alarm any kind of temperature sensor, able to switch from ON/OFF status if a certain measured value is detected, is required. Actions to be taken before this situation are user-programmable (see *Alarms with user-programmable actions*). The **°C** icon will blink.



External alarm. This protection acts when any digital input is externally activated. Actions to be taken before this situation are user-programmable (see *Alarms with user-programmable actions*). The **EXT** icon will blink.



Alarm due to overload. The controlling unit permits the output power or current of the generator to be monitored by an external metering unit, and also the detection of the alarm event by means of a digital input. Actions to be taken before this situation are user-programmable (see *Alarms with user-programmable actions*). The **A** icon will blink.



Alarm due to low battery voltage. This protection acts when the battery voltage falls under a user-programmed value. The siren will be activated and the **BAT** icon will blink.



Alarm due to wrong starting process. This protection acts when the engine starting process has not been succeeded according to the preset conditions, once the number of allowable starting attempts has already been completed. The siren will be activated and the **START** icon will blink.



Alarm due to wrong contactor operation. This protection acts when the "contactor surveillance" option is enabled and the confirmation of a successful operation has not been received after that the switch on / off command signal has been issued to any contactor. (See the "Contactor surveillance" Section).

Alarms with user-programmable actions

Since the actions to be taken in case of certain alarm events cannot be set by default, these are fully user-programmable to be adapted to the particular requirements of every installation. So, the user-programmable actions involve the alarms due to **Fuel level, Oil pressure, High temperature, External alarm and Overload**.

For any of the previously enumerated alarm events, the user can select a series of actions to be executed:

- IS ▶ Immediate stop
- SR ▶ Siren activation
- IS SR ▶ Immediate stop and Siren activation
- GS ▶ Gradual stop
- GS SR ▶ Gradual stop and Siren activation
- None ▶ No action to be taken

Siren activation. The **CGM96-SR** provides a relay output that might be used for the activation of a siren. This output can be user-programmed to give an only pulse with a certain duration, or to give a recurrent signal.

Gradual stop. The power generator will be turned off, but this will be kept running in idle conditions during a defined time so that the engine is properly cooled.

Immediate stop. The power generator will be immediately turned off with no cooling process.

CONTACTOR SURVEILLANCE

The **CGM96-SR** is factory-supplied with the **contactor operation control system**. Under certain circumstances, the **CGM96-SR** will give the appropriate orders to switch on/off the network / generator contactors, but, how can we be totally sure that the contactor operation has been successfully completed?

It could happen, for instance, that a wire is released from its terminals, or a contactor is blocked and does not respond to the command signals. Some contactors are equipped with an auxiliary circuit (for operation control) that would permit a control signal to be sent to the **CGM96-SR**.

When the **Contactor surveillance** option is enabled, the **CGM96-SR** will expect the confirmation of a successful operation when it has issued a command to a contactor. In case that this confirmation is not received after several attempts, then the alarm due to wrong contactor operation will act: the siren will be activated and the icon referred to the faulty contactor will blink.

SETTING ACTIONS BY KEYBOARD

A basic setting of the **CGM96-SR** can be done by means of the frontal keyboard. So, following the below enumerated instructions and with the help of the configuration table, the instrument setup can be modified if necessary. This setting process by keyboard is, naturally, appropriate for its application over already installed units that require any kind of on-site reprogramming.

To complete a more accurate setting of the instrument it is advisable the use of the free-delivered software called "**CGM96 EasyPro**".

Navigation

To access this setting mode the instrument must be powered off, and then powered on back while **START**, **RESET** and **MODE** push-buttons are being simultaneously pressed.

START & RESET & MODE    ⇒ Access setting mode



To execute this previous action it is not necessary to remove the external wiring of the instrument, just set it to the **OFF** position, wait until its disconnection, and then simultaneously press the above indicated three push-buttons.

All the **MODE** and **ALARMS** leds will simultaneously blink to indicate that the setting mode has been successfully accessed.


From this moment, the **ALARM** leds will indicate the active parameter (always starting from the first one) and the value programmed for this parameter will be given by the combination shown by the **MODE** leds.

Diverse options are then available according to the pressed push-buttons:

RESET  ⇒ To move forward to the next the parameter to be set

STOP & RESET   ⇒ To move back to the previous the parameter to be set

MODE  ⇒ To pass to the next option for the active parameter. When the last option is reached, the first one is again available for its choice.

START  ⇒ To save the new configuration and exit the setting mode

STOP  ⇒ To void any modification and exit the setting mode

This setting mode permits the user to move forward or back along all parameters and to effectuate all the required modifications. The user can at any moment exit the setting mode voiding any possible modification, in case that he is not sure about the suitability of the new configuration.

When the setting mode is exited with the **SAVE** option, the **ALARM** and **MODE** leds will blink again, to indicate us that the modifications has been saved in memory, and the instrument will be reset to the normal operation.

When the setting mode is exited with the **DO NOT SAVE** option, then no led will blink, and the instrument will be reset to the normal operation.

User-configurable parameters

All parameters are user-configurable through the push-buttons, excepts for these below listed:

Level of battery minimum voltage
Level of Terminal D+ voltage, when used as a starting condition
Generator frequency, when used as a starting condition
rpm, when used as a starting condition through Pick-Up
Pulse / revolution ratio, when used as a starting condition through Pick-Up
W connection frequency, when used as a starting condition
Siren time periods

Above parameters are numerical values, therefore they must be programmed by means of the CGM96 EasyPro software

- 1 Network rated voltage (V)**
This value must coincide with the value indicated in the rear table of the **CGM96-SR**
- 2 Network voltage lower limit RED (%)**
Value in % with respect to the rated value, that determines the minimum allowable value of the network voltage. (The "NO" option disables the alarm activation)
- 3 Network voltage upper limit RED (%)**
Value in % with respect to the rated value, that determines the maximum allowable value of the network voltage. (The "NO" option disables the alarm activation)
- 4 Network rated frequency (Hz)**
The network rated frequency
- 5 Network frequency range (%)**
Value (in %) that determines the maximum allowable error of the network frequency. (The "NO" option disables the alarm activation)
- 6 Delay for network disconnection (s)**
Period of time during which the network must be continuously out of the preset allowable values before the network contactor will be switched off. If the "GEN" option is selected, then the network will not be disconnected until the generator is ready for functioning.
- 7 Delay for generator starting initiation (s)**
Period of time during which the network must be continuously out of the preset allowable values before the generator starting sequence will be initiated.

- 8 Pre-heating**
Ability to pre-heat the engine before starting it up.
- 9 Pre-heating period (s)**
Duration of the pre-heating process.
- 10 Maximum duration of the starting command (s)**
Maximum duration of the starting command
- 11 Delay time between successive starting attempts (s)**
Delay time between successive starting attempts
- 12 Maximum number of starting attempts**
Maximum number of times that the starting process will be attempted. Once completed, an alarm will be activated.
- 13 Starting control process by oil pressure**
The presence of an oil pressure is a condition that determines that the starting process has been executed.
- 14 Type of condition by oil pressure**
(OR) sufficient condition, (AND) necessary condition (See "Starting process control" Section)
- 15 Starting control process by Terminal D+**
To exceed the preset level of Terminal D+ voltage is a condition that determines that the starting process has been executed (See "Starting process control" and "Terminal D+ wiring mode" Sections)
- 16 Type of condition by Terminal D+**
(OR) sufficient condition, (AND) necessary condition
- 17 Starting control process by generator frequency**
To exceed the preset level is a condition that determines that the starting process has been executed.
- 18 Type of condition by generator frequency**
(OR) sufficient condition, (AND) necessary condition (See "Starting process control" Section)
- 19 Type of condition by W connection**
To exceed the preset level is a condition that determines that the starting process has been executed (See "Starting process control" and "W connection wiring mode" Sections).
- 20 Type of condition by W connection**
(OR) sufficient condition, (AND) necessary condition.
- 21 Starting control process by Pick-Up**
To exceed the preset level is a condition that determines that the starting process has been executed (See "Starting process control" and "Pick-Up wiring mode" Sections).
- 22 Type of condition by Pick-Up**
(OR) sufficient condition, (AND) necessary condition (See "Starting process control" Section)

- 23 Minimum time for return to network (s)**
Minimum period of time during which the network must be within the preset allowable values before the downstream loads are again supplied from the network.
- 24 Engine cooling period (s)**
Period of time that the engine is running under idle conditions before it is definitively stopped.
- 25 Engine stop method**
(EXC) The engine stops due to the excitation of the fuel choke electrovalve.
(NO EXC) The engine stops because the excitation of the fuel pass electrovalve is cut.
- 26 Duration of the stop command (s)**
Duration of the of the fuel choke electrovalve excitation
- 27 Generator voltage lower limit (%)**
Value in % with respect to the rated value, that determines the minimum allowable value of the generator voltage. (The "NO" option disables the alarm activation).
- 28 Generator voltage upper limit (%)**
Value in % with respect to the rated value, that determines the maximum allowable value of the generator voltage. (The "NO" option disables the alarm activation).
- 29 Generator frequency range (%)**
Value (in %) that determines the maximum allowable error of the generator frequency. (The "NO" option disables the alarm activation)
- 30 Delay for generator disconnection (s)**
Period of time during which the generator must be continuously out of the preset allowable values before the generator contactor will be switched off.
- 31 Fuel alarm signal (V)**
Value at the input that must be considered as an alarm event (Vbat or GND)
- 32 Action in case of fuel alarm event**
See *Alarms with user-programmable actions*
- 33 Oil alarm signal (V)**
Value at the input when we have Low Oil Pressure (Vbat or GND)
- 34 Action in case of oil alarm event**
See *Alarms with user-programmable actions*
- 35 Temperature alarm signal (V)**
Value at the input that must be considered as an alarm event (Vbat or GND)
- 36 Action in case of temperature alarm event**
See *Alarms with user-programmable actions*
- 37 External alarm signal (V)**
Value at the input that must be considered as an alarm event (Vbat or GND)
- 38 Action in case of external alarm event**
See *Alarms with user-programmable actions*
- 39 Overload alarm signal (V)**
Value at the input that must be considered as an alarm event (Vbat or GND)
- 40 Action in case of overload alarm event**
See *Alarms with user-programmable actions*
- 41 Not used**
Reserved control field
- 42 Action in case of remote control command**
NSG ► Switch the network contactor off, start the generator up, switch the generator contactor on
SNG ► Start the generator up, switch the network contactor off, switch the generator contactor on
- 43 Alarm siren type**
1 T ► The siren will be activated one time
REP ► The siren will be repeatedly activated
- 44 Contactor surveillance system enabled**
See "Contactor surveillance" Section
- 45 Software version**
Version of the instrument software. Only for info purposes.

	Alarm signaling LED indicate the active parameter to be set.																																			
	Mode signaling LED indicate the value of the selected parameter.																																			
1	Network rated voltage (V)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2	Network voltage lower limit RED (%)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
3	Network voltage upper limit RED (%)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
4	Network rated frequency (Hz)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
5	Network frequency range (%)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
6	Delay for network disconnection (s)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
7	Delay for generator starting initiation (s)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
8	Pre-heating	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
9	Pre-heating period (s)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
10	Maximum duration of the starting command (s)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
11	Delay time between successive starting attempts (s)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
12	Maximum number of starting attempts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
13	Starting control process by oil pressure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
14	Type of condition by oil pressure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
15	Starting control process by Terminal D+	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
16	Type of condition by Terminal D+	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
17	Starting control process by generator frequency	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
18	Type of condition by generator frequency	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
19	Type of condition by W connection	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
20	Type of condition by W connection	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
21	Starting control process by Pick-Up	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
22	Type of condition by Pick-Up	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
23	Minimum time for return to network (s)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			

1	2	3	4	5	6	7	8	9	10	11	12	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
63	100	115	125	200	215	230	240	380	400	415	480	
-2	-5	-7	-10	-12	-15	-17	-20	-25	-30	-40	NO	
+2	+5	+7	+10	+12	+15	+17	+20	+25	+30	+40	NO	
50	60	400										
0,5	0,7	1,0	1,5	2,0	NO							
1	3	5	10	15	20	30	60	GEN				
1	3	5	10	20	30	45	60	90	100	125	150	
No	1st	Always	No pre-heating process. Only for the 1st attempt. Always.									
3	5	10	15	20	30	45	60					
2	3	4	5	6	7	10	15					
2	5	7	10	15	20	30	60					
1	3	6	10	15								
Yes	No											
OR	AND											
Yes	No											
OR	AND											
Yes	No											
OR	AND											
Yes	No											
OR	AND											
Yes	No											
OR	AND											
1	3	5	10	20	30	45	60	90	100	125	150	

Alarm signaling LED indicate the active parameter to be set.							
Mode signaling LED indicate the value of the selected parameter.							
24	Engine cooling period (s)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25	Engine stop method	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26	Duration of the stop command (s)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
27	Generator voltage lower limit (%)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28	Generator voltage upper limit (%)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29	Generator frequency range (%)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30	Delay for generator disconnection (s)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
31	Fuel alarm signal (V)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
32	Action in case of fuel alarm event	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
33	Oil alarm signal (V)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
34	Action in case of oil alarm event	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35	Temperature alarm signal (V)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
36	Action in case of temperature alarm event	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
37	External alarm signal (V)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
38	Action in case of external alarm event	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
39	Overload alarm signal (V)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
40	Action in case of overload alarm event	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
41	Not used (Reserved)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
42	Action in case of remote control command	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
43	Alarm siren type	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
44	Contactur surveillance system enabled	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
45	Software version	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

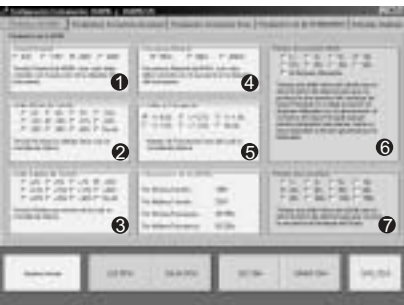
1	2	3	4	5	6	7	8	9	10	11	12
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	10	15	30	45	60	90	120	240	360	480	600
Exc	NoExc	Stop by excitation or by excitation cut.									
5	10	15	30	45	60	120	180				
-2	-5	-7	-10	-15	-20	-30	-40	NO	} NO ⇒ No alarm is activated		
+2	+5	+7	+10	+15	+20	+30	+40	NO			
±0,5	±1,0	±2,0	±5,0	±7,5	±8,3	±10	±15	NO			
1	3	5	10	15	20	30	60				
Vbat	GND										
IS	SR	IS SR	GS	GS SR	None						
Vbat	GND										
IS	SR	IS SR	GS	GS SR	None						
Vbat	GND										
IS	SR	IS SR	GS	GS SR	None						
Vbat	GND										
IS	SR	IS SR	GS	GS SR	None						
None	None										
NSG	SNG	N ⇒ Switch network off, S ⇒ Start generator up, A ⇒ Switch on generator									
1T	REP	1T ⇒ One time, REP ⇒ Repeatedly									
No	Yes										
01	02	03	04	05	06	07	08	09	10	11	12

SETTING ACTIONS BY SOFTWARE (CGM96 EasyPro)

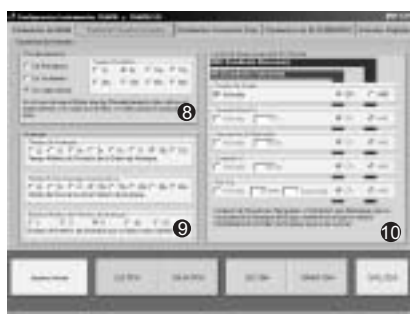
The **CGM96-SR** is factory-supplied with a software appropriate to accomplish the necessary setting actions on the instrument, via the RS-232 communication port in a PC set. Setup procedure by means of the software enables the user to easily and intuitively program all parameters referred to the controlling unit performance.

Five kinds of parameters are user-programmable within the program:

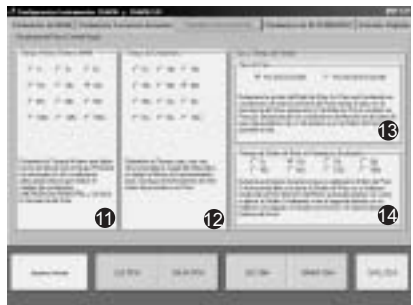
- ▶ Network parameters
- ▶ Starting sequence parameters
- ▶ Stop sequence parameters
- ▶ Power generator parameters
- ▶ Digital inputs



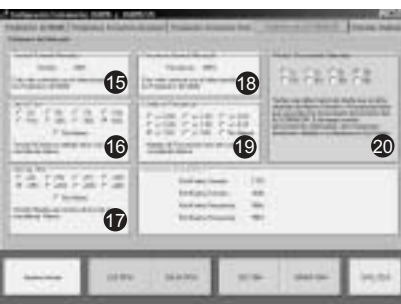
- NETWORK**
- 1- Rated voltage
 - 2- Voltage lower limit
 - 3- Voltage upper limit
 - 4- Rated frequency
 - 5- Allowable frequency range
 - 6- Delay for network disconnection
 - 7- Delay Starting process



- STARTING SEQUENCE**
- 8- Pre-heating
 - 9- Starting
 - 10- Control of started generator



- STOP SEQUENCE**
- 11- Minimum time for return to network
 - 12- Engine cooling period
 - 13- Engine stop method
 - 14- Duration of the stop command



■ GENERATOR

- 15- Generator rated voltage
- 16- Voltage lower limit
- 17- Voltage upper limit
- 18- Generator rated frequency
- 19- Allowable frequency range
- 20- Delay for generator disconnection



■ DIGITAL INPUTS

- 21- Fuel alarm
- 22- Oil alarm
- 23- Temperature alarm
- 24- External alarm
- 25- Alarm by overload
- 26- Remote control signal
- 27- Alarm siren type
- 28- Contactor surveillance
- 29- Battery control

Once all parameter has been set, then the user can:

- ▶ Save the setup into the **CGM96-SR**.
- ▶ Read the setup from the **CGM96-SR**.
- ▶ Save the setup for a later use.
- ▶ Print a record out of the setup defined for a particular **CGM96-SR** unit.

This report can be further viewed, printed out and saved using Microsoft **Word**.

APPLICATION NOTES

Remote Control (Definition)

The **CGM96-SR** is equipped with an input that permits the user to establish a remote control system over the instrument.

This input detects three different situations:

- a) Free (no connection)
- b) Connected to **GND** (Generator starting command)
- c) Connected to **+Vbat** (Generator stop command)

That way, we can erect applications where the **CGM96-SR** can operate together with other instruments, as the below examples illustrate:

Interfacing the CGM96-SR with a PLC

Let's suppose a system that involves a relatively complex industrial process which is controlled by a PLC set.

Under certain circumstances, a diesel power generator must be started up with the need of no user supervision.

To set a program in the PLC to execute this action would clearly be costly and complicated, therefore, the best way to accomplish this function would be the connection of the **Remote Control** input in the **CGM96-SR** to a digital output in the PLC (it is highly advisable the use of an auxiliary relay to ensure the proper insulation and signal levels).

The PLC unit must be programmed to start the generator up by the energization of the auxiliary relay (the **CGM96-SR** will receive the **GND** signal), and to maintain the generator stopped by keeping the relay dienergized (the **CGM96-SR** will receive the **+Vbat** signal).

START and STOP external push-buttons

For those cases that imply a very frequent generator starting and stop actions, two start and stop external push-button might be very useful.

This situation is simply solved with the use of the **Remote Ctrl** input and two external push-buttons. So, one must be connected to **GND** (Stop) and the other one to **+Vbat** (Start).

Automatic starting and stop actions

Let's suppose that a diesel power generator must be started up every day, from Monday to Friday, to supply during two hours the watering system of a plantation.

The simple wiring method for this case involves the connection of the output from one timer to the **Remote Ctrl** input in the **CGM96-SR**.

Automatic mode and Remote control combination

Let's suppose a water tank that supplies water to a urban area. This tank is kept full by means of an electric pump that draws the water up from a well, and our aim is to guarantee that the tank will always have the appropriate water level.

So, we control the generator with a **CGM96-SR** set at **AUTO** mode, so that in case of a network voltage loss, the generator will automatically start up to supply the pump.

But ... It is really necessary to start the generator up if the water level of the tank is still over the minimum allowable level?, the answer is **NOT**.

The solution is again very simple, the **Remote Ctrl** input must be connected to a level sensor, that disables the starting action, even in case of a network voltage loss, if the water tank does not need to be filled yet.