

Instructions for use

SDMO

Nexys 2

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1. Introduction to MICS Nexys

MICS Nexys is a command / control module designed to control the generating set.
This module, with a 12V direct current supply, is incorporated into the following control consoles:



Fig. 1.1 – View of control consoles

2. Description

2.1. Standard configuration

The MICS Nexys comprises a polycarbonate control panel housing on which the following components are mounted:

- on the front side:
 - an emergency stop button
 - a key switch for starting up or shutting down the entire module (ON/OFF)
 - a protection fuse
 - three push-buttons
 - an LCD screen
- on the rear side
 - an electronic card with 5 connectors, used for the electrical connection of the generating set to the Nexys module
 - a standard configuration electronic "measurements" card for 40 kVA and higher

2.1.1 Presentation of the front panel

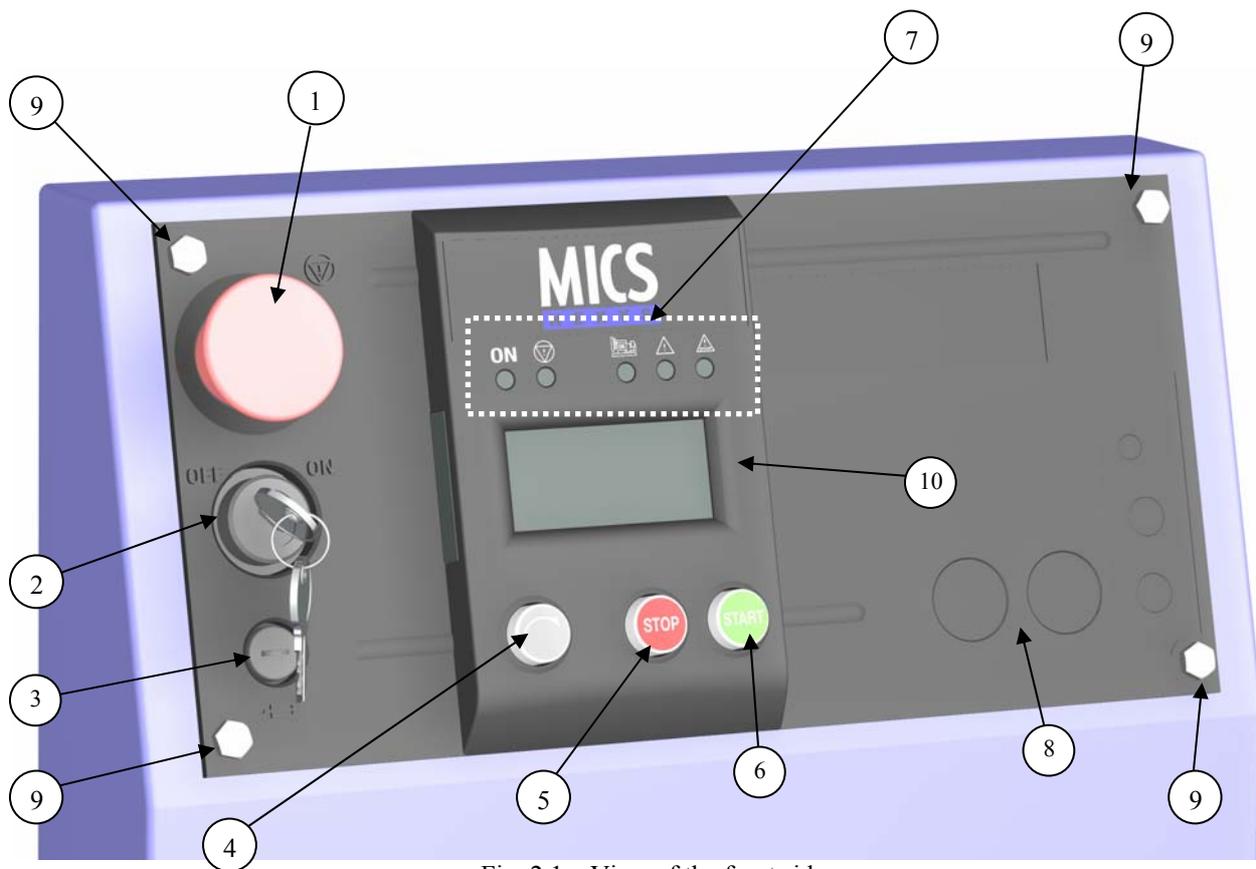


Fig. 2.1 – View of the front side

- ① Emergency stop button for switching off the generating set in the event of a fault which could endanger personnel or damage equipment
- ② Key switch for starting up/shutting down the module and RESET function
- ③ Electronic card protection fuse
- ④ Screen-scroll button, press successively to access the various screens which are available
- ⑤ STOP button, press to switch off the generating set
- ⑥ START button, press to switch on the generating set
- ⑦ Normal operation LEDs and alarm and fault warning LEDs
- ⑧ Slot reserved for panel fascia options
- ⑨ Mounting bolt.
- ⑩ LCD for displaying alarms and faults, operating states, electrical and mechanical quantities

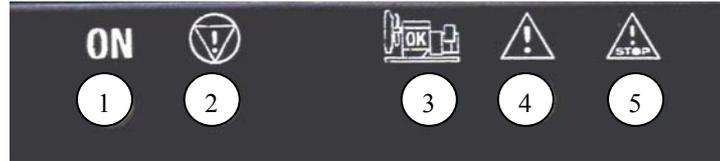


Fig. 2.2 – Description of the LEDs

A lit LED indicates:

- ① Module being supplied (green, lights up and remains lit)
- ② Emergency stop activated (control panel or external emergency stop) (red, lights up and remains lit)
- ③ Visualisation of starting phase and speed/voltage stabilisation (flashing) and generating set operating OK or set ready to generate (green, lights up and remains lit)
- ④ General alarm (orange, flashing)
- ⑤ General fault (red, flashing).

2.1.2 Introduction to pictograms

The pictograms are as follows:

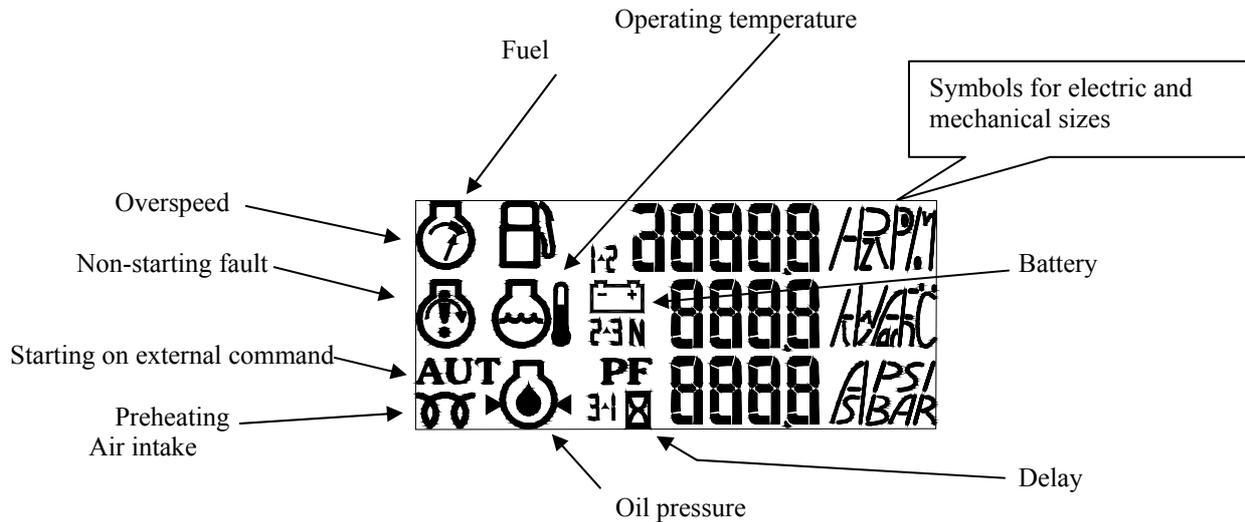


Fig. 2.3 – View of pictograms

- The "fuel level" pictogram is used to display the fault, the alarm and the fuel level.
- The "operating temperature" and "oil pressure" pictograms are used to display the fault and analog value
- The "overspeed" and "non-starting fault" pictograms are used to display the fault.
- The "battery" pictogram is used to display the "alternator charge" fault and to indicate the battery voltage.

2.1.3 Introduction to the rear panel

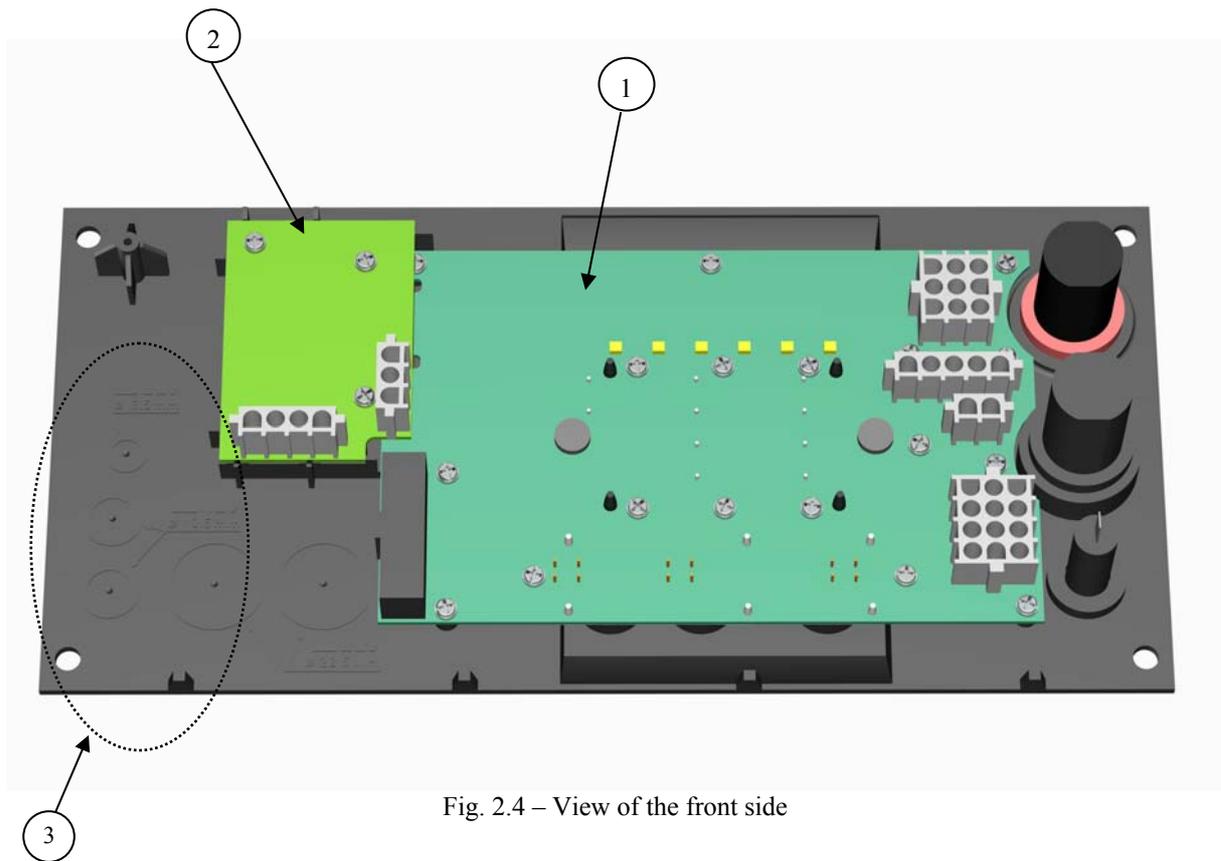


Fig. 2.4 – View of the front side

- ① "Base" electronic card
- ② "Measurements" electronic card (optional if the power rating of the generating set is less than 30 kVA)
- ③ Slot for options.

2.2. Safeguards

The following options may be added to the standard configuration:

- Measurements card (if the power rating of the generating set is less than 30 kVA)
 - Connected directly to the base card, used for measuring and displaying:
 - Electrical quantities (phase-to-neutral voltages "V" and phase-to-phase voltages "U", phase currents "I")
 - Analogue motor quantities (oil pressure, temperature of coolant and level of fuel in daily service tank)
- Auto. pack
 - ✓ Comprising a preheating switch for the motor cooling circuit, a 12 V – 2.5 A charger connected to the Nexys module via a wiring harness, a terminal block (2 terminals) and a wiring harness for connecting the external starting command
- External starting command
 - ✓ 2-strand wiring harness with customer connection to 2 terminals on the control console
- Report pack (remote information report)
 - ✓ Provides the following information, on voltage-free switch:
 - Generating set ready to generate
 - General fault
 - Low fuel level fault or alarm (depending on configuration)
- Speed potentiometer
 - ✓ Used for adjusting the motor speed by means of a potentiometer located in the panel fascia (this adjustment is only possible for motors equipped with an electronic regulation system)
- Voltage potentiometer
 - ✓ Used for adjusting the alternating voltage supplied by the alternator by means of a potentiometer located in the panel fascia (the potentiometer must be connected to a regulator enabling external adjustment)

- Horn
 - ✓ Connected to the "horn" output (2 fast-on connectors located on the electronic card), can be used to sound an audible warning in the event of a fault of any type. A "horn off" button may be pressed to inhibit operation of the horn (only the horn).
- Auxiliary emergency stop button
- Power detection
 - ✓ Used for starting the generating set in automatic mode following:
 - A loss of power (one or more phases)
 - A decrease or increase in mains voltage (time and threshold-adjustable)
 - A direction of rotation check
- Differential protection
 - ✓ This may be provided either:
 - By a "vigi" unit connected directly to the circuit breaker (current delay and threshold)
 - Or by a time and threshold-adjustable differential relay.
- Protection against insulation faults
 - Used on "IT" systems, unearthed or impedance-earthed neutral, and set up by adding a "PIM" (Permanent Insulation Monitor)
- Automatic filling
 - Used to automatically top up the fuel in the daily storage tank. The fuel pump option comprises a control module connected to the thermal-magnetic circuit breaker for protecting the engine.
- 600 Volts
 - This option is used mainly for the Canadian market (600 Volts). A three-phase transformer is positioned between the alternator and the Nexys database measurement input. When performing the 600 Volt configuration, a weighting coefficient is applied to the voltage measurement.

3. Use

The command / control module supports two possible modes:

- manual mode
- automatic mode.

3.1. Manual mode

3.1.1 Starting the generating set

	Check that the generating set circuit breaker has triggered.
Danger	

- ❶ connect the generating set battery.
- ❷ turn the key switch to the ON position (without forcing it)
 - ✓ All of the LEDs light up for 2 seconds, to confirm that they are operating correctly.
 - ✓ If the LEDs do not light up, check the protection fuse and replace it if necessary.
 - ✓ All the items on the screen are displayed for 2 seconds.
 - ✓ Only the "ON" LED remains lit to indicate that the module is powered up.
 - ✓ The following screen appears.

	The first line displays the motor speed in RPM. The second line displays the battery voltage in volts (V).
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- ✓ Check the battery voltage (min. 12 V)

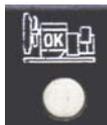
- ❸ Press (once briefly) the green "START" button.
 - ✓ If the motor is equipped with an air preheating system, there is a 10-second delay before the motor starts (preheating activation period).
 - ✓ The following screen appears

	The third line displays the air preheating time remaining (with pictograms representing a resistor and an hourglass).
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- ✓ If the motor is not fitted with an air preheating system or once the preheating delay has elapsed, the engine starts up (start of a cycle comprising 3 attempts to start up the engine).
- ✓ The following screen appears.



	The number of successive and automatic starting attempts is limited to 3.
Warning	



Note: the LED flashes as soon as the START button is pressed and continues to flash until the frequency stabilises if a "measurements" card has not been inserted and until the frequency and voltage stabilise if a "measurements" card has been inserted.

Following stabilisation, the LED light comes on continuously.



3.1.2 Stopping the generating set

- ❶ trigger the circuit breaker located at the base of the centre console
- ❷ Let the motor run under no load for 1 to 2 minutes to allow it to cool.
- ❸ press the "STOP" button to stop the generating set.
- ❹ switch off the MICS Nexys module by switching the key to "OFF" (without forcing it).

3.2. Automatic mode

3.2.1 Starting the generating set

	When the command / control module is operational (key switch turned to ON), the generating set may start without warning, upon issue of an external starting command (if the module is equipped with this option).
Danger	

When the external command is activated, the "AUT" pictogram appears.

Sequence	Screen display
❶ 5-second delay (if this programming has been performed) to take micro breaks on the line into account. The third line on the screen displays the time remaining for the line micro break.	

At the end of this delay, two scenarios are possible:

Generating set with air preheating option		
Sequence	Screen display	LED status
❷ Air preheating for 10 seconds		Flashing:
❸ Starting ❹ Generating set runs at a stable speed		Continuously lit: In this case, charging is possible.

Generating set without air preheating option		
Sequence	Screen display	LED status
<p>➊ Starting</p>		<p>Flashing:</p>
<p>➋ Generating set runs at a stable speed</p>		<p>Permanently lit:</p> <p>In this case, charging is possible.</p>

Note:

The MICS Nexys does not control opening and closing commands for the N/E reversing switch. In this case, and if the N/E switch is a third-party component, it must have its own control mechanism for the N/E switching components.

3.2.2 Stopping the generating set

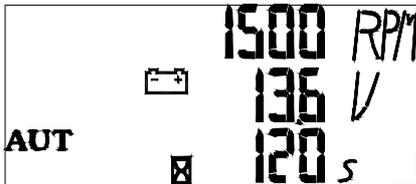
When the power is restored (controlled by the SDMO switch), there is a time delay. After this (120 seconds), the external command disappears, the "emergency" switch is triggered and the "normal" switch is deactivated.

When the external command disappears, the "AUT" pictogram continues to flash followed by the cooling delay.



The LED remains lit.

The following screen appears.



When this is complete (120 seconds), the generating set switches off and the "AUT" pictogram goes out.

- (1) The emergency switch is controlled by the reversing switch control.
- (2) The motor cooling delay is integrated into the Nexys module.

3.3. Special features of automatic mode

Pressing the "STOP" button when the external command is active ("AUT" pictogram flashing) will stop the generating set immediately in general fault mode,



the general fault LED will light up (flashing) and the following message will appear:



S o S means S.O.S.

000 represents a fault code

010 Refer to the list of fault codes in Section 4.4.

3.4. Emergency stop

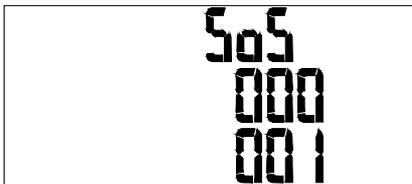
Pressing the emergency stop button switches off the generating set immediately.



The LED lights up red and remains lit, the



LED flashes and the following screen appears:



This screen displays the SOS message and the emergency stop fault code (also see section 4.4).

To restart, it is necessary to:

- ❶ resolve the fault which has required the emergency stop button to be pressed
- ❷ release the emergency stop button by turning it clockwise
- ❸ acknowledge (reset) the fault by moving the key switch to OFF, waiting for the "ON" LED to go out completely and then moving the key switch to ON.

Note:

Once you have set the key switch to "OFF", if you do not wait for the "ON" LED to go out completely, the fault will not be acknowledged on restarting.

4. Alarms and faults

4.1. Display

Faults and alarms are displayed as follows:

① Faults



The red LED (general fault) will flash whenever a fault occurs.
In conjunction with this LED:



- The red LED lights up and remains lit (only for the emergency stop fault).
 - If a pictogram appears on the LCD screen this represents the fault along with the SOS message.
- OR**
- An SOS message appears flashing with a fault code.

② Alarms

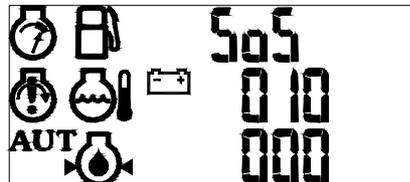


Whenever an alarm occurs, the yellow LED (general alarm) lights up flashing.
In conjunction with this LED:

- A pictogram appears flashing on the LCD screen to indicate the alarm along with the SOS message.

4.2. Appearance of a fault or an alarm

The appearance of a fault or an alarm causes the following screen to be displayed (one or more pictograms or a fault code along with the SOS message are displayed).
This screen always appears before the screen referred to in Section 3.1.1

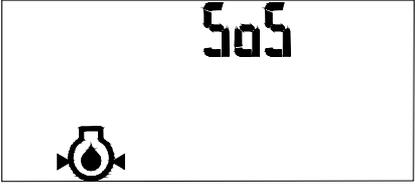
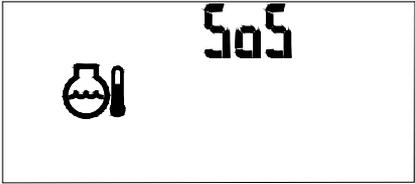
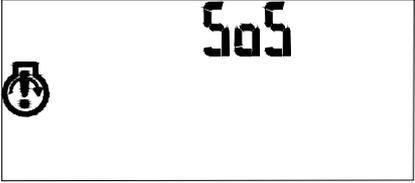


The user can access the following screens by pressing the key

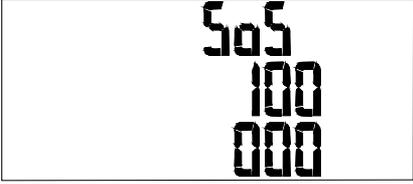
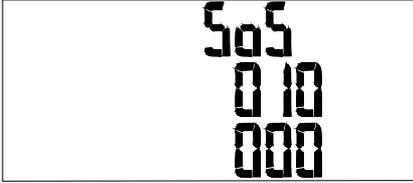
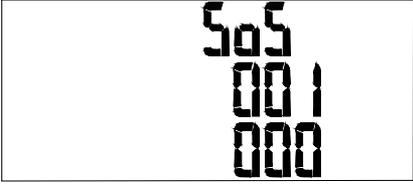
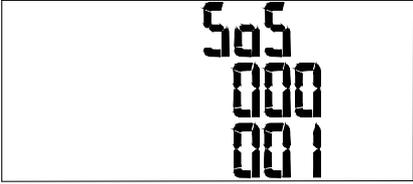
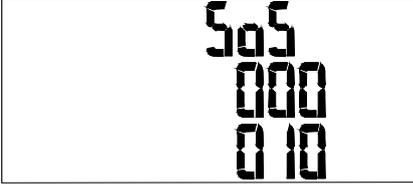


The fault or alarm screen will disappear once the fault or alarm has been removed.
Only one fault is displayed on this screen (the fault which caused the generating set to stop).
If one or more faults have appeared after the first fault, they can only be displayed after the first fault has been reset (press "Reset" as many times as the number of faults present).
Note: an alarm can appear at the same time as a fault.

4.3. List of faults which will cause the generating set to stop and generate a pictogram

<p>Oil pressure fault: Indicates that the oil pressure is incorrect</p>	<p>Associated pictogram</p> 
<p>Engine temperature fault: Indicates that the engine temperature is too high.</p>	<p>Associated pictogram</p> 
<p>Non-starting fault: Indicates that there have been three consecutive unsuccessful starting attempts.</p>	<p>Associated pictogram</p> 
<p>Overspeed fault: Indicates an excessive generating set running speed.</p>	<p>Associated pictogram</p> 
<p>Low fuel level fault: Indicates the need to top up the fuel.</p>	<p>Associated pictogram</p> 

4.4. List of faults which will cause the generating set to stop and generate a fault code

<p>Low coolant level fault: indicates that the level of coolant is low in the radiator (linked to a two second time delay). Or Overload or short-circuit fault (optional): with the circuit breaker SD contact closing (overload or short-circuit), the generating set switches off immediately also causing the main circuit breaker to be triggered.</p>	<p>Associated message</p> 
<p>Additional fault linked to message opposite: is displayed in the following two cases:</p> <ul style="list-style-type: none"> ➤ Differential fault (1) ➤ insulation fault (2) <p>(1) Differential fault (optional): with a differential fault causing the activation of the differential relay, the generating set stops immediately also causing the main circuit breaker to be tripped.</p> <p>(2) Insulation fault (optional): with an insulation fault causing the activation of the control unit performing insulation, the generating set stops immediately.</p>	<p>Associated message</p> 
<p>Underspeed fault: indicates an incorrect rotation speed (below 1000 rpm).</p>	<p>Associated message</p> 
<p>Emergency stop or external emergency stop fault (see Section 3.4).</p>	<p>Associated message</p> 
<p>"STOP" fault activated if the "STOP" button is pressed whilst the "AUT" LED is flashing to indicate that the generating set is operating in automatic mode.</p>	<p>Associated message</p> 

4.5. List of alarms associated with a pictogram

<p>Low fuel level alarm: Indicates the need to fill up with fuel.</p>	<p>Associated pictogram</p> 
<p>"Alternator charging fault" alarm indicates a problem affecting the alternator charging rate.</p>	<p>Associated pictogram</p> 

5. Special notes

• Emergency stop

If the shunt on terminal block B11 is removed (control console interior), the generating set stops immediately due to an emergency stop fault. This terminal block is used for connecting the external emergency stop device (cover or set site).

• Protection fuse

If the fuse blows during operation, the generating set will stop without indicating a fault. It is then necessary to switch the key switch to OFF, locate the cause of the fault, replace the fuse then switch the switch back to ON.

• MANU and AUTO modes

If the set is started in manu mode (START button) and an external command is received, this takes priority over manu mode. The generating set will only stop if the external command disappears. Pressing STOP, causes the generating set to stop immediately, a general fault appears (LED) and the **SOS 010** fault code appears.
000.

• AUTO mode with programmed delays

When an external command is received, the "AUT" pictogram flashes during the line micro break and restoration phases as well as during the starting and speed/frequency stabilisation phases.

• AUTO mode with non-programmed delays

When an external command is received, the "AUT" pictogram flashes during the starting and speed/frequency stabilisation phases. Once the external command is no longer being received, the "AUT" LED pictogram stops flashing.

• Starting and stopping the generating set

- If the engine has not reached 1000 rpm when the set is started and 5 seconds after the starter power has been cut, the generating set stops due to a non-starting fault.
- In the event of an alternator charging fault, the corresponding pictogram appears (this fault is interpreted as a warning).
- If the STOP button is pressed or the external order associated with the power return is no longer present, the generating set stops normally. It will only be possible to restart the set after the engine has been stopped completely at a frequency < 7.5 Hz and a delay of 3 seconds has elapsed.

• **Low fuel level**

The low fuel level pictogram flashes if the low fuel level has been configured as an alarm.

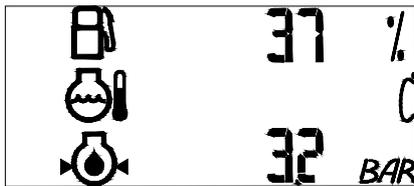
The low fuel level pictogram lights up and remains lit if the low fuel level has been configured as a fault. In this case, the general fault LED flashes red.

• **Screen display when pictograms appear**

If there is no screen display when the pictograms below appear, this displays that the transmitter is disconnected.



Example:



No display opposite the "coolant temperature" pictogram means that the transmitter is disconnected.

• **Coolant temperature**

If the coolant temperature falls below 30°C or rises above 120°C, the display will flash at a value of 30°C or 120°C respectively.

• **LCD screen**

The LCD screen lights up:

- Permanently whilst the generating set is starting up or operating
- For 5 minutes:
 - Following the appearance of an event when the generating set is in stop mode (an event may be a fault, an alarm or one of the 3 control buttons being pressed)
 - Following a normal stop of the generating set by means of pressing the "STOP" button or if the external command disappears

6. Fault finding

	Probable causes	Remedial action
The motor will not start	Fuel level too low	Fill up with fuel
	Faulty module supply fuse	Check and replace the fuse
	ON/OFF switch in "OFF" position	Turn the switch to "ON"
	Emergency stop button pressed	Release the emergency stop button and reset the fault, moving the switch to "OFF".
	Faulty battery	Check and replace the battery if necessary
	No cable connection between the Nexys module and the charge alternator	Check the connection between the Nexys module (pin 7 on the 12-pin connector) and the D+ terminal on the charge alternator. If the cable connection is OK, check the module function by connecting pin 7 to earth. If the motor starts, there is a problem with the charge alternator.
No LED displays and no screen display	Faulty module supply fuse	Check and replace the fuse
	Faulty battery	Check and replace the battery if necessary
"AUT" LED lights up and remains lit and "General fault" LED flashes	Incorrect wiring to the external command	Correct the wiring
	Alternating current connected to the external command input	Identify and correct the fault

7. Maintenance

	<p>Before starting any operation:</p> <ul style="list-style-type: none"> - Switch off the generating set - check that the generating set circuit breaker is open - disconnect the battery - turn the key switch to the OFF position - Check that no power is being supplied to the centre console (for example: mains powered battery charger).
<p>Danger</p>	

7.1. Replacing the fuse

- ❶ Use a suitable screwdriver or your hand to turn the cap in an anti-clockwise direction until it can be removed.
- ❷ Remove and replace the fuse (use a fuse of the same size and rating).
- ❸ Refit the cap in the reverse order to removal.

8. Programming visualisation

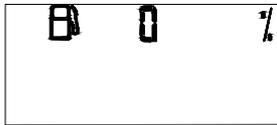
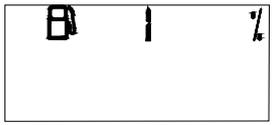
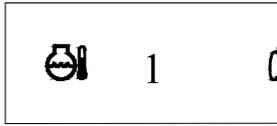
The MICS Nexys is factory-set for your application. The user can display this programming as follows:

- As soon as the Nexys module is switched on (key switch to "ON"), press  until the LED test is complete (until the LEDs go out).

The programming will now appear on the screen. Each parameter appears for 4 seconds, screen by screen. The parameters appear on the screen in the following order:

Parameter label	Possible parameter value(s)
Operating frequency	50, 60 Hz
Nominal speed	1500, 1800, 3000, 3600 RPM
Preheating plug	1 = active, 0 = not active
Micro break and line restoration delay	AUT = 1 (active) AUT = 0 (not active)
Alternator charging fault	Active = 1 Not active = 0
Low fuel level	Alarm = 0 Fault = 1
Ventilation delay for gas engines	Active = 1 Not active = 0

If the "measurements" card has been inserted into the module, the following parameters will appear on the screen:

Parameter label	Possible parameter value(s)	
Type of line	3P+N, 3P, 2P+N, 1P+N	
Nominal voltage (in volts)	208, 220, 230, 240, 380, 400, 415, 440, 480, 500, 600	
Current transformers primary current value (in A)	30, 40, 60, 100, 150, 200, 250, 300, 400, 500, 600, 800, 1000, 1200, 1600	
Fuel level	No display if	
	Display if	
Coolant temperature	No display if	
	Display if	

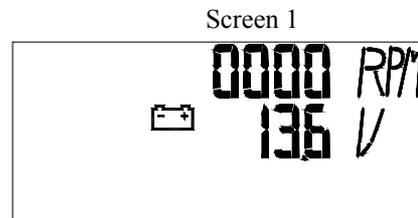
Parameter label	Possible parameter value(s)	
Motor oil pressure	No display if	
	Display if	

9. Viewing the different screens

When the generating set is running, various screens can be accessed.

The number of screens which can be accessed depends on whether or not the "measurements" card has been inserted.

When it is switched on, the following screen is displayed



Press the screen scroll button to navigate from one screen to another.

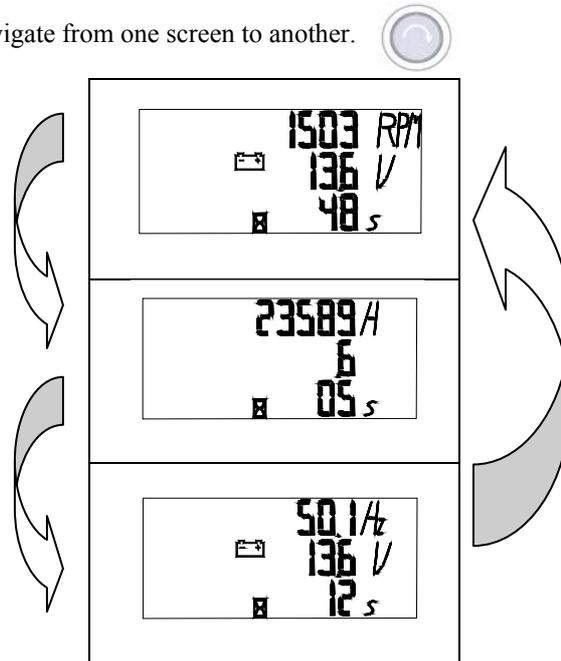


Fig. 9.1 – Example of possible navigation between screens

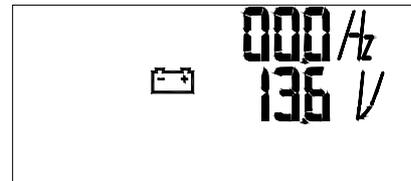
- 1st press
 - The first line displays the number of operating hours.
 - The second line displays the number of operating minutes.

Screen 2



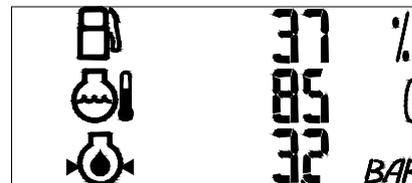
- 2nd press
 - the first line displays the frequency of the AC current supplied by the generating set (Hz).
 - The second line displays the battery voltage (V).

Screen 3



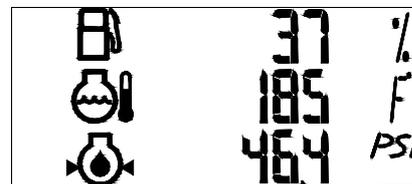
- 3rd press
 - If a "measurements" card has not been inserted, the display reverts to screen 1.
 - If a "measurements" card has been inserted into the module, the screen opposite appears:
 - the first line displays the fuel level in the daily service tank as a percentage of the tank capacity
 - the second line displays the temperature of the coolant (°C).
 - the third line displays the oil pressure (Bar).

Screen 4



- 4th press
 - If a "measurements" card has not been inserted, the display reverts to screen 1.
 - If a "measurements" card has been inserted into the module, the screen opposite appears:
 - the first line displays the fuel level in the daily service tank as a percentage of the tank capacity
 - the second line displays the temperature of the coolant (°C).
 - the third line displays the oil pressure (PSI).

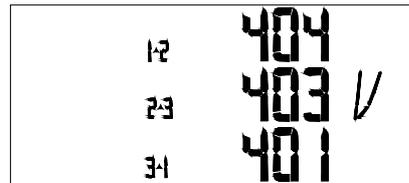
Screen 5



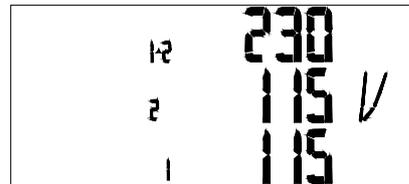
The following screens display the electrical quantities based on the type of application of the generating set:

- ✓ three-phase + N (3Ph + N)
 - ✓ three-phase (3Ph)
 - ✓ two-phase + N (2Ph + N)
 - ✓ single-phase (1Ph + N)
- The following screens appear the 5th time the button is pressed:
 - screen A: three-phase applications + N and three-phase
 - or
 - screen E : two-phase applications + N
 - or
 - screen D: two-phase applications + neutral

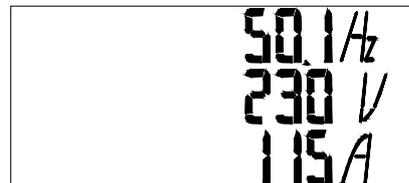
Screen A



Screen E



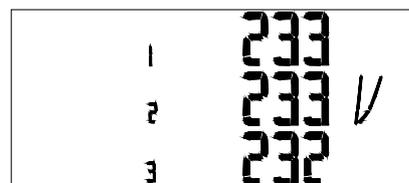
Screen D



- The first line displays the voltage between phases 1 and 2 (V).
 - The second line displays the voltage between phases 2 and 3 (V).
 - The third line displays the voltage between phases 1 and 3 (V).
-
- The first line displays the voltage between phases 1 and 2 (V).
 - The second line displays the voltage between phase 2 and neutral (V).
 - The third line displays the voltage between phase 1 and neutral (V).
-
- The first line displays the frequency (Hz).
 - The second line displays the voltage between the phase and neutral (V).
 - the third line displays the current circulating in the phase conductor (Amps (A)).

- The following screens appear the 6th time the button is pressed:
 - screen B: three-phase applications + N and three-phase
 - or
 - screen C: three-phase applications
 - or
 - screen F: two-phase applications
 - or
 - Return to screen 1 for single-phase applications.

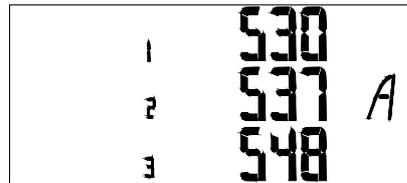
Screen B



- The first line displays the voltage between phase 1 and neutral (V).
- The second line displays the voltage between phase 2 and neutral (V).
- The third line displays the voltage between phase 3 and neutral (V).

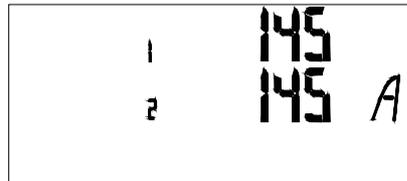
- The first line displays the current circulating in phase 1 (A).
- The second line displays the current circulating in phase 2 (A).
- The third line displays the current circulating in phase 3 (A).

Screen C



- The first line displays the current circulating in phase 1 (A).
- The second line displays the current circulating in phase 2 (A).

Screen F



- The following screens appear the 7th time the button is pressed:
 - Screen C for applications in three-phase + N
 - or
 - Screen D for applications in three-phase, two-phase
 - or
 - Screen 1 for two-phase applications.
- The following screens appear the 8th time the button is pressed:
 - Screen D for applications in three-phase + N
 - or
 - Screen 1 for three-phase applications.
- The following screens appear the 9th time the button is pressed:
 - Screen 1 for three-phase + N applications.