

Instructions for use

Telys level 1

1.06 F

Réf. constructeur :

Réf. GPAO : 33502012701 ind1

SAFETY SYMBOLS CONTENTS

4
1

GB
ENGLISH

SAFETY SYMBOLS



Caution : danger



Caution, refer to the publications supplied with the Genset



Caution : risk of electric shock



Protective clothing required.



Caution : toxic substances



Eye and hearings protection necessary



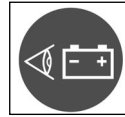
Caution : pressurized fluids



Periodic maintenance required



Caution : high temperature (risk of burning)



Check battery charge



Caution : rotating or moving parts (risk of entanglement)



Recommended Lifting point



Caution : risk of corrosion



Fork lift stacking point



Caution : risk of explosion



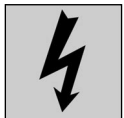
Naked flame and non protected lightning forbidden, no smoking



Authorised personnel only



Do not use water based fire extinguishers



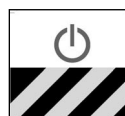
Power



Trailer : link up the earth before starting the generator



Earth



Emergency stop

MACHINERY DIRECTIVE 98/37/CE INSTRUCTION FOR GENERATING SETS

- Access prohibited to unauthorized personnel
- Live installation, potential automatic starting.

PRESENTATION

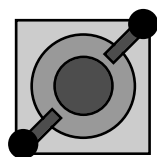
A



B



Key



ENGLISH

Control unit

Generating set programmable controller

Panel light indicator

Lighting for wall mounted or free standing panel

Emergency Stop

The genset shuts down immediately and the control unit goes into STOP mode

MICS AMPG

Device for electrical value display

Potentiometer volts

Adjusts the alternator voltage

Dual frequency switch 50/60 Hz

to select the frequency

Potentiometer switch

to select the voltage

USER MANUAL

Level 1

CONTROL UNIT

Due to our on-going research program and the continual improvements to our products, we reserve the right to make all changes deemed necessary without prior notice.

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Design and production: See documentation:

Manufacturers documentation base for power generating sets + Elec. Eng. Dept. Documentation

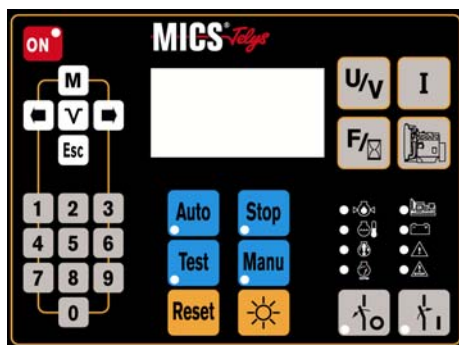
Warning

Changes to the front panel of the MICS Telys

The MICS Telys front panel has been modified.

Leaving aside the colour and design of the keys, the modifications are as follows:

- ❶ the "I" key has been changed to the "I/P" key (output measurements)
- ❷ the "F/⚡" key has been changed to the "F/H" key
- ❸ the "Manu" key has been changed to the "Start" key



previous design



new design

❶ The output measurement function will not be available initially, as software version 1.07G will not be marketed until October 2003. Therefore, repeatedly pressing the "I/P" key will only display the voltages.

❷ The change from the "F/⚡" key to the "F/H" key does not affect the information displayed on the screen.

❸ The most significant change is that from the "Manu" key to the "Start" key. When the generating set is started up in Manu mode, the message shown opposite appears.

| | |
|---|-------------|
| Fuel Lev(%) | 50 |
| E.Speed(RPM) | 0 |
| Batt.(Volts) | 24.2 |
| MANUAL mode selected press MANU to confirm | |

As the "Manu" key is no longer present, **one press** on the "Start" key will trigger the starter motor or the spark plug preheating (depending on configuration).

These modifications will be introduced to the technical documentation during the next update (software update from version 1.06 F to version 1.07 G).

FOREWORD

Control unit upgrade:

The software compatibility is ensured with the old interface boards, meaning it is possible to reprogram, on site, an interface board having a software index 1.01B with a software having an index 1.04D and 1.05E. However, a display defined for software version 1.2 and higher is required to use a software version 1.05E.

Software upgrade 1.04D comprises the following:

- Addition of functions and parameters
- Modification of standard value of certain parameters
- Modification of utilization limits of certain parameters
- Supervision and remote management
- Control/command of engines MTU 2000 and 4000
- Control/command compatible with standards NFPA110 and CSA C282
- Control/command compatible with French standards NF S 61-940 and NF E 37-312
- Control/command for Cummins engines type QST30
- Control/command for Nevada engines
- Generating sets with "multi-voltage" option
- Generating sets with "bi-frequency/bi-voltage" option
- Option 5 module (this module is only used with applications on MTU 2000/4000 engines and CUMMINS engines QST30).

The software version 1.06F used with the CB and CB12 I/O cards extends the functionality and working range of the Telys MICS. A summary of the developments and changes incorporated into the new software is shown below. Each development is then described in detail in the subsequent paragraphs.

Compatibility with earlier I/O cards has been provided, and it is therefore possible to reprogram I/O cards originally using software versions 1.01B, 1.04D or 1.05E with version 1.06F, without having to remove the card.

Software version 1.06F includes the following features:

- Command and control of the JDEC electronics used with the John Deere 6081HF engines using the optional module 5.
- Command and control of the EDC III electronics used with Volvo D12 engines using the optional module 5.
- Changing the number of working hours for the generator (clear or preset) by entering a single access code.
- Option 4 of module 4, allowing operation at three different voltages (480V, 208V and 240V), may be fine tuned to reflect the customer's actual usage.
- The "low coolant level" LED of the optional module 6 comes on when either the 'low coolant level' or 'air cooling inadequate' inputs are enabled (only for NFPA110 applications).
- For gas-powered generators, the "low gas pressure" fault condition now has a five-second fixed timer. This timer prevents the engine being switched off by sudden load changes. In practice, the gas pressure has a tendency to drop when the load increases sharply, before returning to its normal value.

Supervision and remote management:

Supervision and remote management is possible using the "wintelys" software on a PC computer under a Windows 95, 98; NT or 2000 environment.

A complete document describing the supervision and remote management features can be obtained from the "products and development" department.

Supervision and remote management are operational on software version 1.01B with a few restrictions as concerns the various data acquisition and display features. In this respect, with software version 1.01B, it will not be possible to:

- Control the generator set from a remote location
- Display the status of the alarm and fault LEDs on the front panel of the display or retro-information concerning the position of the Normal/Backup switch.

In addition, with software version 1.01B, the MICS Telys is automatically reset when the generating set is configured from a remote location.

For optimum use of the supervision/remote management function, we recommend that you use software version 1.04D.

Module 5:

Module 5 is simply module OPT34 configured as module 5.

This module is programmed specifically for the applications with engines using an integrated control electronics (MTU and Cummins engines).

The selection parameter for this module already exists in software version 1.01B.

However, a line has been added in the INPUTS and OUTPUTS screens to display the logical state of the inputs and outputs of the module according to its programming.



Supervision



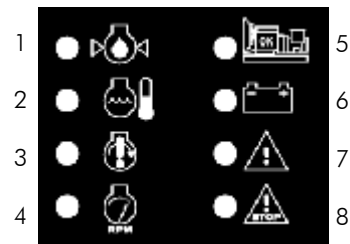
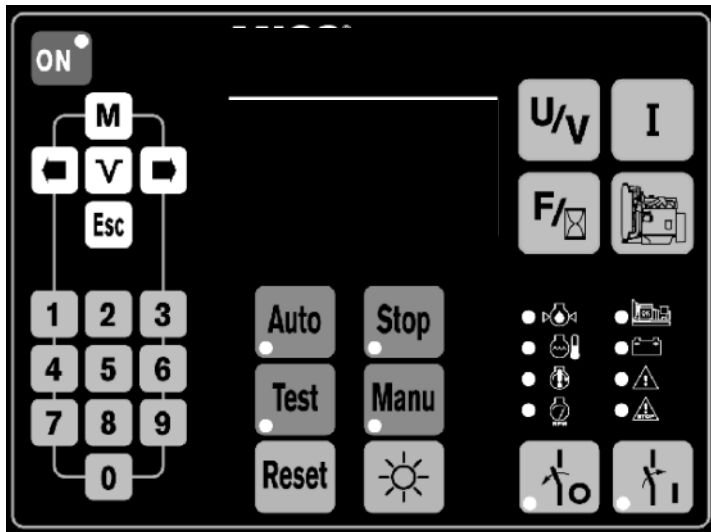
Remote management

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PRESENTATION AND TECHNICALS CHARACTERISTICS



1. Oil pressure fault/shutdown (red LED on).
2. Water T° fault/shutdown (red LED on).
3. Overcranking fault/shutdown (red LED on).
4. Overspeed fault/shutdown (red LED on).
5. Genset on load or ready to take the load (green LED on).
6. Charge alternator fault/shutdown (red LED on).
7. General alarm/warning (yellow LED flashing).
8. General fault/shutdown (red LED flashing).



Power on after automatic shutdown (with LED).



Button to access the main menu (programming/display)



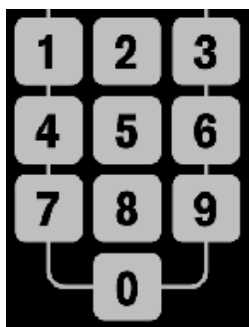
Button to validate a selection.



Button to exit a selection



Buttons to browse through menus and adjust contrast



Number pad



Button to open genset breaker (with LED).



Button to close genset breaker (with LED).



Button to display the voltages.



Button to display the currents



Button to display the frequency and hours counter



Button to display the engine parameters



Button to select Auto mode (with LED).



Button to select Test mode (with LED).



Button reset a fault.



Button to select Manu mode (with LED).



Button to select Manu mode (with LED).



Button to test the LEDs (except ON button LED).

1 - Features

- Display module (DM)
- Interface board available in 2 versions (CB, CB12) depending on customer optional equipment.
- Option 3 module, option 4 module and option 5 module (OPT 34)
- Block building system enabling multiple combinations.

Note: DM required in all combinations

2 - Display module (Fig. 2)

- LCD screen, 8 lines 21 characters, built-in back-light and keyboard adjustable contrast
- 28 momentary push buttons (two types; 10 and 13 dia.)
- 15 display LEDs (alarms/warnings, faults/shutdowns, status, operating modes)
- UL approved polycarbonate case supplied with cable and connector for connection to the interface board
- Dimensions 192x144x70
- Quick installation using brackets and nuts screws
- IP65 on panel face with seal (not supplied), IP20 inside
- Extremely user friendly man-machine interface: multiple-message screens, diagnostic, genset status, ...

3 - Interface board (Fig. 1)

- CB = Main board
- CB12 = Main board with option 1 and option 2 built in
- Electronics in a sheet steel case (base + lid)
- Dimensions : 435x263x31
- Voltage bus; alternator, mains and DC built into the printed circuit board (see paragraphs 7, 8, 9 and 13)
- 16 bit microcontroller, (Flash, RAM and EEPROM) memories, real-time clock, battery backup for time and date
- Supply from 9 to 33Volts DC and from 6Volts DC, for voltage drop at start-up
- All connections are built into the printed circuit board on both sides with full screen printing

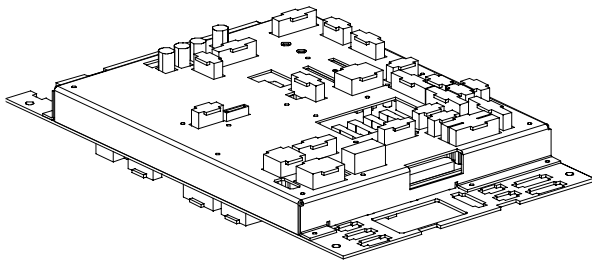


Fig. 1 - CB12 board

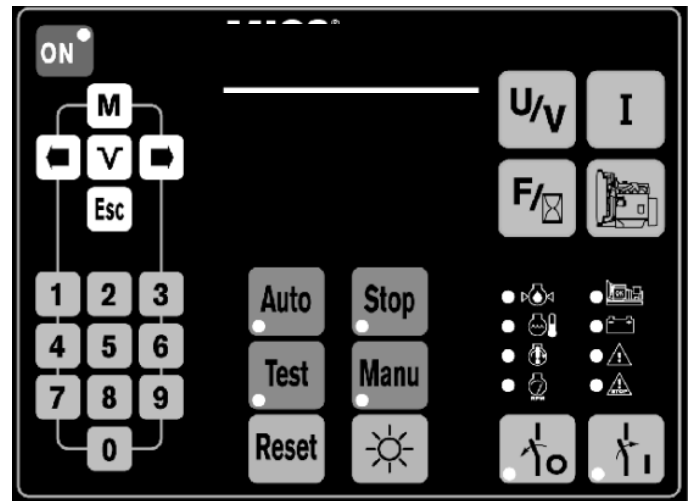


Fig. 2 - Display module

4 - Logical/analog I/O

All inputs and outputs are allocated to a specific use (see tables below).

| Type | Logical output description | CB | CB12 |
|--------|-------------------------------------|----|------|
| F | oil pressure | x | x |
| F | water temperature | x | x |
| A or F | day tank low fuel level | x | x |
| F | emergency stop | x | x |
| A or F | overload or short-circuit | x | x |
| C | water heater thermostat | x | x |
| C | external start-up command | x | x |
| F | radiator low water level | x | x |
| C | Mains contactor home position | x | x |
| C | Stand-by contactor home position | x | x |
| F | external emergency stop | x | x |
| F | oil temperature | | x |
| F | low oil level | | x |
| A or F | water heater failure | | x |
| A or F | battery charger failure | | x |
| A or F | differential or CIC trip | | x |
| F | differential relay available | | x |
| F | Constant Insulation Check available | | x |
| F | air cooler disconnection | | x |
| F | air cooler low water level | | x |
| A or F | fuel pump 1 disconnection | | x |
| A or F | retention bund | | x |
| C | bulk tank CF80 | | x |
| A or F | bulk tank low fuel level | | x |
| C | EJP switch (*) | | x |
| C | EJP start-up (*) | | x |
| C | EJP advanced warning (*) | | x |

* : France only

| Type | Logical output description | CB |
|----------|--------------------------------|----|
| T | fuel solenoid control | x |
| T | starter 1 control | x |
| T | engine preglow control | x |
| T | water heater control | x |
| T | hooter control (general fault) | x |
| R | Mains contactor control | x |
| R | Stand-by contactor control | x |
| T | air damper control | |
| T | starter 2 control | |
| R | electro-flaps control | |
| T | fuel pump 1 control | |
| R | CIC remote contact | |
| Type | Analogue input description | CB |
| Ω | oil pressure indication | x |
| Ω | water temperature indication | x |

Note: Alarm or Fault selection via programming

Key:

A=Alarm, F=Fault, ana.=analogue, C=Control

T=Transistor, R=Relay, Ω =resistive

Technical characteristics

5 - Option 3, 4 and 5 modules (OPT34)

- Modular case, dimensions : 160x90x58
- Programming specific to each module (dip-switch)
- 8 allocated inputs and 10 programmable outputs on option 3 for remote volt free contacts
- 8 programmable inputs and 10 programmable outputs on option 4 , with 24 preprogrammed options
- Specific programming of some entries

6 - Alternator current input

- 4-wire, unisolated, on current transformer with 5A secondary (not built into the electronics)
- Measurements in true root mean square values
- Measurement range: 60A to 5000A

7 - Alternator voltage input

- 4-wire (3ph + neutral), unisolated, with 12.5A-500Vac built in power bus in 50 and 60Hz
- Measurements in true root mean square values
- Frequency measurement on phase 1 for screen display and engine overspeed sensing

8 - Mains voltage mains 1

- 4-wire (3ph + neutral), unisolated, with 15A-600Vac built in power bus in 50 and 60Hz
- No voltage and frequency measurements

9 - Mains voltage mains 2

- 2-wire (1ph + neutral), unisolated, with 10A-240Vac built in power bus in 50 and 60Hz
- No voltage and frequency measurements

10 - Charge alternator input

- Charge alternator excitation and fault
- Starter hardware fail safe on software failure

11 - Communication

- RS485 serial port with J-Bus protocol (Mod bus RTD)
- 9-pin SUB-D connector
- Monitoring possible in local mode (≤ 1000 meters)
- Remote management possible with 2 modems (> 1000 m)
- Optional monitoring/remote management software

12 - CAN Link

- Link between interface board and option module(s)
- Standard CAN bus version 2.0b, 9-pin SUB-D connector for CC supply to module
- 1 connector on CB and CB1, 2 connectors on CB12

13 - Fuse protection

- F_n, F1, F2, F3, 12.5A-500V fuses for alternator bus
- Mains bus protected by circuit breaker in the ATS
- F5, 10A fuse for the DC bus
- F7, 2.5A delayed action fuse for the interface board
- F6, 1A delayed action fuse for option 3 Module
- F8, 1A delayed action fuse for option 4, 5 Module (CB12 only)

14 - Connections

- Multi-pin (2 to 15 pins) connectors with polarizer
- Number of connectors varies with interface board
- Each connector has a specific use

15 - Programming options

- Multiple programming possibilities
- Access code required to read/program

16 - Options connected to the interface

| Option description | CB | CB12 |
|--|----|------|
| external start-up command | x | x |
| auto predisposition + external command | x | x |
| 3ph+neutral or 1ph+N mains connection | x | x |
| battery charger (3 possible ratings) | x | x |
| water heater (3 poss. depending on supply V) | x | x |
| hooter | x | x |
| RS485 for monitoring or remote management | x | x |
| option 3 module / CAN bus connection | x | x |
| additional engine kit (9 options) (*) | | x |
| electro-flaps (DC or AC) | | x |
| anti-condensation heater | | x |
| EJP (switch, adv. warning and start-up) French only | | x |
| 1ph or 3ph fuel pump (control & power) | | x |
| Air cooler (low level, disconnection) | | x |
| differential protection and MX coil control | | x |
| CIC protection with remote contact and MX coil control | | x |
| bulk tank fuel pump (CF80, low level, retention bund) | | x |
| AMPG with optional RS485 | | x |
| option 4 module / CAN bus connection | | x |
| three-alarm (OP,WT,OT) and module 4 kit | | x |

(*)indication and fault/shutdown for oil temperature, low oil level, water heater failure and alarm/warning for, oil pressure, water temperature, oil temperature, air damper control, starter 2 control.

17 - Sorties relais

- Max switching voltage: 250Vac (277Vac for *)
- Mains and Stand-by contactor control outputs: 4.9A, 1500VA breaking capacity at $\cos\phi=0.7$
- Electro-flaps outputs: 500mA & CIC remote contact:1A
- MX coil control output (*): 4.9A (optional relay on baseplate)

18 - Transistor outputs

- Protected against short-circuit
- Output for fuel solenoid/panel lighting: 700mA
- Other outputs: 300mA

19 - Hardware configuration

- C14/C15 connector, auxiliaries voltage selection
- C7 dip-switch, RS485 terminator
- P3 dip-switch, CAN bus terminator
- Dip-switch selection for VDE option

20 - Environment and standards

- Operating temperature: -15°C to +60°C
- Storage temperature: -20°C to +70°C
- Resistance to shocks: IK01, vibration: to CEI68-2-6
- Salt mist resistance : 96 hours according to EN68011-2-11
- Humidity : 95 % of humidity at 45°C.
- EMC :
 - Generic standards EN50081-2 and EN50082-2
 - Emissions EN55011 Class A
 - Immunity EN61000-4.2, EN61000-4.3, EN61000-4.4, EN61000-4.6, EN61000-4.8, ENV50201
- CE mark, UL listed, CSA certified

1. FOREWORD

1.1. Precautions

□ The control unit is connected to various AC voltage sources (alternator, mains, ...).

⚠ While the generating set is idle, any work inside the control equipment is strictly forbidden as some parts of the electric and electronic equipment stay live (mains voltage available).

□ If work inside the control panel is required, it must be performed by staff authorised to work live.

⚠ When the generating set is running, the fuses marked **Fn, F1, F2, F3** are at a dangerous potential which can lead to electric shock when touched.

These fuses must be replaced when the generating set is in complete shutdown. For any voltage measurement on these four fuses, please use suitable equipment.

□ The generating set can be equipped with a remote start-up (simple contact) or with an automatic starting system [mains failure + ATS (Mains/Stand-by changeover switch)] .

⚠ Beware of possible electric shock by contact with any live part, during the generating set start up.

1.2. Power connection

For power connection, make sure that flexible cables of suitable cross section are used to avoid overheating and a major in-line voltage drop. Depending on laying method, ambient temperature and proximity of other cables, the conductor's cross section may vary.

1.3. Electric connections (control)

□ **Generating set with manual start only** (from the control unit keyboard)
No external connection to make.

□ **Generating set with remote (without mains) or automatic (with mains) start-up**
For proper operation, make the connections on the user terminal block as per the diagram below.

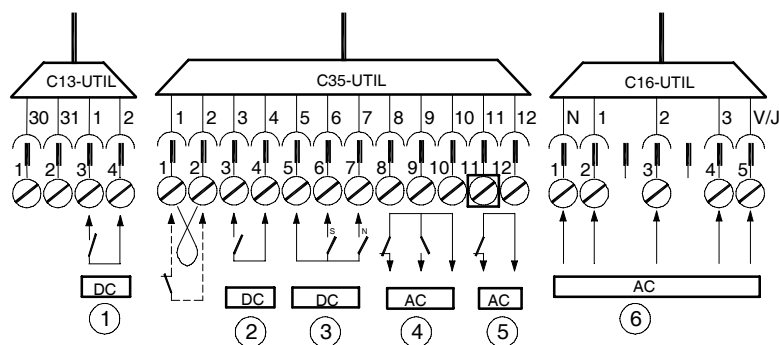
☞ For DC signals, we recommend the use of a 5-core (5x1.5mm²) flexible cable between the ATS and the user terminal block.

☞ For AC signals, we recommend the use of a 12-core (12G1.5mm²) flexible cable between the ATS and the user terminal block.

(G means cable with a Green/Yellow conductor)

Note: for a remote start only, a 2x1.5mm² flexible cable is sufficient (see ① overleaf)

⚠ The cross sections above are given as a guide as they can vary depending on the current to be drawn, length, temperature and control cable laying method.



① External command (mains sensing or client contact)

③ Mains and Stand-by contactors home position

⑤ Mains contactor control

② Output C/B fault auxiliary signal contact

④ Stand-by contactor control

⑥ 1 or 3 phase water heater

□ If the user does not connect an ATS from our range, it is imperative to observe the board relay characteristics given below and to check that the coils power requirements are within these parameters.

Rated current=5A

Rated voltage=250Vac

Maximum breaking capacity under a 0.7 cos φ: 1500VA

⚠ Not observing the above characteristics will damage or even destroy the board control relays.

1.4. Battery preliminary inspection and commissioning

The battery must be connected for the control unit to operate and the generating set to start, hence the need to check its connection:

- Red wire, positive polarity (+),
- Black wire, negative polarity (-).

Some generating sets are equipped with a battery isolator enabling the electric circuit to be isolated. Check that it is in the position enabling the operation.

⚠ The battery is supplied without electrolyte. Fill the battery with electrolyte at least 20 minutes before any start-up attempt (see maintenance manual).

1.5. Control unit first power-up

If the battery is connected and the electrolyte level correct, control unit powers up automatically and the initialisation screen below appears.



- This screen is visible for eight seconds. All LEDs are lit and will go out after 3 seconds except the **ON** button LED. When initialisation is complete, the **Stop** button LED comes on again.
- If other LEDs are lit or flashing, refer to paragraph 6.

Note 1: The **0** button LED can also be lit (see paragraph 18).

Note 2: During initialisation, the display module software version appears on screen.

1.6. Welcome screens

□ Screen 1

After the initialisation phase, the screen below appears. The operator is then able to choose in which language he wants the messages to be displayed on the control unit screen. Four languages are available: French, English, Spanish and Portuguese.

| LANGUAGE SELECTION | |
|--------------------|--|
| V: Valid Esc: Exit | |
| ■ International | |
| o French | |
| o English | |
| o Spanish | |
| o Portugues | |

The language selection screen is then displayed. The cursor flashes by default on "international". If no action is taken while the four squares are displayed in the small overlaid window, the MICS Telys is automatically positioned on the international language. You then have around 6 seconds to change the language by pressing the **➔** button then the **V** or **Esc** button (*).

(*) By pressing the **V** button, you store the selected language in memory meaning that the next time you power up the unit, the cursor will automatically go to the previously selected language. In addition, when you press the **V** button, the system goes to the next screen for modification of the date and time.

(*) If you press the **Esc** button, the selected language is not stored in memory. The next time the unit is powered up, the cursor will automatically be positioned on the international language.

- By pressing **➔** or **➔**, the operator places the cursor over the required language. Note : Depending on the cursor position, the text of the two upper lines changes to enable the operator to know where he is.

Press **Esc** to go directly to the " overview " screen (see paragraph 1.7).
There, the language used will be the one where the cursor was positioned.

Example : Cursor positioned over **English**. Pressing **Esc** configures the control unit in English. Any messages will appear be in English.

- If neither **V** nor **Esc** is pressed, the " overview " screen (see paragraph 1.7) appears automatically after three minutes. There, the language used will be the one where the cursor was positioned.

Not until the appearance of the " overview " screen will it be possible to start the generating set, however all inputs stay active (example: appearance of a fault).

- Press **V** to go to the second welcome screen, in the language where the cursor was before pressing **V**.

Note: If the "international" language is selected, refer to the "international language" appendix.

□ Screen 2

Screen 2 will allow the date and time to be modified. This is only required when the clocks change because the internal clock is kept active by a lithium battery while control unit is powered off.

| DATE / TIME | |
|--------------------|--------|
| V: Valid Esc: Exit | |
| ■ Day | : 12 |
| o Month | : 01 |
| o Year | : 2000 |
| o Hour | : 16 |
| o Minute | : 30 |

- The cursor **■** flashes over the **o** sign of the first line.
- Press **➔** to move the cursor to the next line, except if it flashes next to **Minute**.
- Press **➔** to move the cursor to the previous line, except if it flashes next to Day.
- By pressing **➔** or **➔**, the operator places the cursor on the line to be changed.

By following the instructions below, it is possible to change, line after line, the day, month, year, hours and minutes.

- Press **V** to take the cursor to the first digit after the : sign. By pressing one of the ten buttons **0** to **9**, the first digit is modified and the cursor is automatically moved to the second digit.

The cursor can be moved to the second digit by pressing **➔** instead of one of the ten digits **0** to **9**. Afterwards, it can be moved back to the first digit by pressing **➔**.

Note: the year has four digits.

- Press **V** again to take the cursor back to **o** and to validate the entry made.
- When the cursor is positioned over one of the digits, press **Esc** to bring it back to **o**, without saving the entry made or without changing the previous value if there was no entry.
- Press **Esc** without any entry to go to the " overview " screen (see paragraph 1.7). There, the date and time taken into account will be the ones appearing on the screen before **Esc** was pressed.

⚠ When the clocks change, if you press **Esc** without changing the date and time, the generating set alarms, faults and status will not be correctly date and time stamped.

- Press **Esc** after changing one of more parameters (hour, minute,...) to go to the " overview " screen (see paragraph 1.7). There, the time and date taken into account will be those which were modified on screen before **Esc** was pressed.

- If neither **V** nor **Esc** is pressed, the " overview " screen appears after three minutes. There, the time and date will be those of the previous screen (before going automatically to the " overview " screen).

Note : Not until the appearance of the " overview " screen will it be possible to start the generating set, however all engine protection shut-downs stay active (example: appearance of a fault).

1.7. " Overview " screen

The " overview " screen is the screen which appears systematically by default.

Using the four buttons: **U/V**, **I**, **F/X**, **Engine**, you can access all " overview " type screens (see paragraphs 4 and 5) which give details on:

- Electrical values and engine parameters
- Generating set alarms and faults
- Status of the generating set and its auxiliaries, date and time

□ Normal operation

Following the language selection screen and/or possible date and time modification screen, the " overview " screen below appears during normal operating conditions.

| | |
|---------------|-------------|
| Fuel Lev(%) | 50 |
| E.Speed(RPM) | 0 |
| Batt. (Volts) | 24.2 |
| ext command=0 | 16:45 |
| gen stopped | 12/01/00 |

- The first line indicates the fuel level, in %, in the day tank.
- The second line indicates the engine speed in RPM.
- The third line indicates the battery voltage in Volts.
- The fourth and fifth lines indicate the generating set status, the time, date and various other messages (see paragraph 9).

- If the cabling of the fuel level analogue input is faulty or if the sensor itself is faulty, there will be no digital indication on screen. However, the wording **Fuel Lev(%)** will appear (see also paragraph 5). This particular display is used to perform a quick diagnostic on the physical status of the input (sensor and cabling).
- If the fuel level analogue sensor is not available on the day tank, there will be no display on screen (see paragraph 5). This is the case for the Pacific range generating sets where the fuel level is read directly from a mechanical gauge.

Nota 1 : Press successively one of the four buttons previously mentioned to modify the screen above (see paragraphs 4 and 5).

Nota 2 : the date is given in day/month/year

□ Abnormal operation

During abnormal operating conditions (presence of an alarm or fault, several alarms or faults or a mixture of both), the previous screen is replaced by the following one:

| | |
|----------------------|----------|
| Fuel Lev(%) | 10 |
| E.Speed(RPM) | 0 |
| Batt. (Volts) | 24.2 |
| Alarm Low fuel level | |
| ext command=0 | 17:25 |
| gen stopped | 12/01/00 |

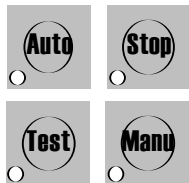
- Two extra lines are inserted to display the malfunctions (alarms and/or faults).
- Engine parameters and electric values appear on screen in a shortened form.
- The two lower lines stay unchanged.

The display of the generating set alarms and faults is detailed in paragraph 8.

2. OPERATING MODES

The control unit has four operating modes which can be accessed via the four blue coloured buttons on the display module:

- Mode **Stop**
- Mode **Manu**
- Mode **Auto**
- Mode **Test**



2.1. Stop Mode

After powering up (initialization, language selection and/or possible time and date update), the control unit automatically goes into **Stop** mode. The red LED associated with the button comes on and the "overview screen" appears.

| | |
|---------------|-------------|
| Fuel Lev(%) | 50 |
| E.Speed(RPM) | 0 |
| Batt. (Volts) | 24.2 |
| ext command=0 | 16:45 |
| gen stopped | 12/01/00 |

Example of " overview " screen in **Stop** mode.

- In this operating mode, any event appearance (alarm, fault, external command, ...) is signalled on screen. However, the generating set is stopped and automatic start-up is not possible.

| | | |
|--------------------|-----|------------|
| Ph./ph. | U12 | 396 |
| voltages | U23 | 390 |
| (Volts) | U31 | 395 |
| STOP mode selected | | |

- When the generating set is running and whatever the current mode (**Auto**, **Test**, **Manu**), press the **Stop** button to stop it instantly without any cooling down. A message appears on screen for two seconds to signal that the button has been taken into account (see screen opposite).

Note: if the engine is equipped with a water heater, the latter is not powered in **Stop** mode.

2.2. Manu Mode

- The **Local** mode provides local control from the keyboard, ie, the operator is wholly in control of the start procedure.
- This mode may be accessed from the **Stop** or **AUTO** modes. Two alternative programmed solutions are available :
 - 1 press on the key
 - 2 presses on thse key

a) Single key press :

The generator starts in **Local** mode after a single press on the **Local** key. Using this function:

- The red LED usually associated with the **Local** key does not flash,
- The message confirming the selection of **Local** mode does not appear.

b) Dual key presses :

- Pressing the **Local** key once, briefly, selects the mode and displays the screen below. The key's associated red LED also flashes.
- Pressing the **Local** key, briefly, a second time confirms the mode selection. The red LED comes on permanently and the generator set then enters its automatic start procedure phase (see paragraph 17).

| | |
|---|-------------|
| Fuel Lev(%) | 50 |
| E.Speed(RPM) | 0 |
| Batt. (Volts) | 24.2 |
| MANU mode selected press MANU to confirm | |

- Whilst the red LED is flashing (awaiting confirmation), the mode may still be changed by selecting either **Stop** or **Auto** mode.
- If the first pressure on the **Local** key is not confirmed within two minutes, one of two things may happen s:
 - **Stop** mode will be selected automatically if this was the previous mode, or,
 - **Auto** mode will be selected automatically if that were the previous mode.

- In **Local** mode, switching between Normal and Emergency is enabled by pressing the 0 or 1 keys, but only if the green LED is ON (see paragraph 18). The operator still has control over the Normal/EmergencyY switch and the generator set.
- If an external Start command appears on the screen, the control unit remains in **Local** mode. The operator then has to change from the **Local** to **AUTO** mode.

2.3. Auto Mode

Auto mode can be accessed from **Stop**, **Manu** or **Test** mode. Press the **Auto** button to select the mode and to display the left-hand side screen below for two seconds. The red LED associated with the button comes on, then the right-hand screen appears. This screen corresponds to the standby state of the generating set.

| | |
|--------------------|-------------|
| Fuel Lev(%) | 50 |
| E.Speed(RPM) | 0 |
| Batt. (Volts) | 24.2 |
| AUTO mode selected | |

| | |
|---------------|-------------|
| Fuel Lev(%) | 50 |
| E.Speed(RPM) | 0 |
| Batt. (Volts) | 24.2 |
| ext command=0 | 16:50 |
| gen stand-by | 12/01/00 |

- From the waiting screen, the generating set start-up is conditioned by:
 - ① Logical status change of the 'external command' input
 - ② Logical status change of the 'EJP advance warning' or 'EJP start-up' inputs (France only)
 - ③ Activation of the clock mode built into (if the mode is programmed).

Example: the right-hand side screen above informs of the logical status of the external start-up command (abbreviation ext **command=0** or ext **command=1**):

- External command = 0, no start-up
- External command = 1, imminent start-up possible
- When one of the three start-up conditions changes from 0 to 1 (for ① and ②) or from inactive to active (for ③), a new message informs the operator, then the generating set enters into an automatic start-up phase (see paragraph 17).
- When one of the three start-up conditions changes from 1 to 0 (for ① and ②) or from active to inactive (for ③), a new message informs the operator, then the generating set enters into an automatic shutdown phase (see paragraph 17).
- In **Auto** mode, the ATS toggle is completely automatic (see paragraph 18).

2.4. Test Mode

Test mode can only be accessed from **Auto** mode. If one of the inputs ; external command, EJP advance warning, EJP start-up, is in logical status 1 or if the clock is active, **Test** mode cannot be selected.

- If the inputs; external command, EJP advance warning, EJP start-up, are in logical status 0 or if the clock is inactive, press **Test** button to select the mode and to bring up the screen below. The red LED associated with the button flashes.

| | |
|---|-------------|
| Fuel Lev(%) | 50 |
| E.Speed(RPM) | 0 |
| Batt. (Volts) | 24.2 |
| TEST mode selected press TEST to confirm | |

- Press **Test** button again to confirm the mode, the associated red LED comes on continuously and the generating set then enters into an automatic start-up phase (see paragraph 17).
- When the red LED flashes (waiting for confirmation), the mode can be changed by selecting **Stop** mode or **Auto** mode.

• If you do not press **Test** to confirm, **Auto** mode is automatically selected after two minutes.

- In **Test** mode, the ATS cannot be toggled, this is a no-load operation. The generating set operating time is indicated on screen by a time displayed in minutes and seconds which counts down automatically. When the delay elapses, the generating set shuts down without cooling and automatically goes into **Auto** mode.

| | |
|-------------------------------------|-------------|
| Fuel Level(%) | 50 |
| E.Speed(RPM) | 0 |
| Batt. (Volts) | 24.2 |
| TEST mode eng. stops in: 02' 30" | |

Example of " overview " screen in **Test** mode

There are two minutes and thirty seconds of operation left before the generating set stops and the control unit goes into **Auto** mode.

- During operation, if one of the inputs ; external command, EJP advance warning, EJP start-up, changes logical status (from 0 to 1) or if internal clock is activated, a screen message is displayed to indicate the status change or the clock activation. The **Test** mode timer is bypassed, automatically goes into **Auto** mode, the ATS toggles and you are then back in normal **Auto** mode operation.

3. SLEEP MODE AND AUTOMATIC SHUTDOWN

Is equipped with a sleep mode and an automatic shutdown.

3.1. Sleep mode

Sleep mode is possible when is in **Stop** mode or **Auto** mode with the generating set on stand-by (*). The sleep mode starts automatically after an adjustable time if there is no status change on one of the system logical inputs, no communication with a PC or no keystroke. In this case, the back-light switches off and goes into a minimum consumption mode.

| | |
|---|-------------|
| Fuel Lev(%) | 50 |
| E.Speed(RPM) | 0 |
| Batt. (Volts) | 24.2 |
| ext command=0 16:48 gen stopped 12/01/00 | |

Example of a " overview " screen in sleep mode, the various indications stay visible on screen.

(*) Genset stopped with no external command, no EJP start-up and no clock activation.

- If one the system logical inputs changes status (alarm, fault, thermostat, external command, ...), the messages appear and the back-light switches back on.
- On the appearance of an alarm or a fault not generated by the change of state of an entry, the back-lighting does not come on again.

Note : if a low/high battery voltage alarm or fault or a CAN bus fault appears, the back-light will not switch itself back on.

3.2. Automatic shutdown

Automatic shutdown is only possible when is in **Stop** mode. In **Stop** mode, even if the back-light is switched off, the battery discharges slowly (electronics consumption) in cases where the generating set is not equipped with a battery charger.

To avoid the battery from discharging and thus the generating set from not being able to start, will shut down automatically after a delay. After shutdown, the internal clock stays active. The generating set alarm, fault and status event log is kept unchanged.



Following an automatic shutdown, can be powered up again by simply pressing the **ON** button. Initialisation is carried out in the same conditions as with a first power-up.

After powering up via the **ON** button, automatically goes into **Stop** mode and brings up the " overview " screen (see paragraph 1.7) in the language used before the automatic shutdown. This way, the operator does not need to reselect the language and press **Esc** to return to the " overview " screen.

3.3. Special case

- On the appearance of any fault condition whatsoever, the Telys MICS automatically sets itself into the STOP mode but, at the end of the 'auto cut-off' timer (setting 108 in the Timer menu), the Telys MICS remains switched on. This function is particularly useful for those applications fitted with :
 - An OPT34 module, programmed for Option 3
 - An optional module 6
 - The Wintelys supervision and remote management software.

This feature ensures that the signals provided by these modules (free potential contact, remote module 6 control) and the monitoring software will remain available for remote operating.

4. VIEWING THE ELECTRICAL VALUES

4.1. Voltages

You can view the various AC voltages by pressing the **U/V** button successively. Their values are expressed in true root mean square Volts. Depending on the client's needs (type of electrical installation), several screens are possible:

- 3 phase with neutral (3ph+N)
- 3 phase without neutral (3ph)
- 2 phase (2ph+N)
- 1 phase (1ph+N)

Note: one of the four choices above has been factory programmed as per the client's specification.

☐ 3 phase with neutral (3ph+N)

| | | |
|---------------|----------|------------|
| Ph./ph. | U12 | 399 |
| voltages | U23 | 400 |
| (Volts) | U31 | 398 |
| ext command=1 | 17:05 | |
| gen running | 12/01/00 | |

- Press **U/V** to get the three phase-to-phase voltages:
U12 = voltage across phase 1 and phase 2
U23 = voltage across phase 2 and phase 3
U31 = voltage across phase 3 and phase 1

| | | |
|---------------|----------|------------|
| Ph./neutr. | V1 | 230 |
| voltages | V2 | 230 |
| (Volts) | V3 | 230 |
| ext command=1 | 17:05 | |
| gen running | 12/01/00 | |

- Press **U/V** again to get the three phase-to-neutral voltages:
V1 = voltage across phase 1 and neutral
V2 = voltage across phase 2 and neutral
V3 = voltage across phase 3 and neutral
- Press **U/V** again to bring up the first screen and so on...

☐ 3 phase without neutral (3ph)

| | | |
|---------------|----------|------------|
| Ph./ph. | U12 | 399 |
| voltages | U23 | 400 |
| (Volts) | U31 | 398 |
| ext command=1 | 17:05 | |
| gen running | 12/01/00 | |

- Press **U/V** to get the three phase-to-phase voltages:
U12 = voltage across phase 1 and phase 2
U23 = voltage across phase 2 and phase 3
U31 = voltage across phase 3 and phase 1
- If you press **U/V** nothing changes.

☐ 2 phase (2ph+N)

| | | |
|---------------|----------|------------|
| Half | U1n | 120 |
| voltage | U2n | 122 |
| (Volts) | | |
| ext command=1 | 17:05 | |
| gen running | 12/01/00 | |

- Press **U/V** to get the two half voltages:
U1n = voltage across phase 1 and neutral
U2n = voltage across phase 2 and neutral

| | | |
|---------------|----------|------------|
| Phase | U12 | 242 |
| voltage | | |
| (Volts) | | |
| ext command=1 | 17:05 | |
| gen running | 12/01/00 | |

- Press **U/V** again to get the voltage across the two phases:
U12 = voltage across phase 1 and phase 2
- Press **U/V** again to bring up the first screen and so on ...

☐ 1 phase (1ph+N)

| | | |
|---------------|----------|------------|
| Ph./neutr. | V1 | 230 |
| voltage | | |
| (Volts) | | |
| ext command=1 | 17:05 | |
| gen running | 12/01/00 | |

- Press **U/V** button to get the voltage across phase and neutral:
V1 = voltage across phase 1 and neutral
- If you press **U/V** again, nothing changes.

4.2. Currents

To view the various AC currents, press the **I** button successively. The values are expressed in true root mean square Amps. Depending on the client's needs (type of electrical installation), several screens are possible:

- 3 phase with neutral (3ph+N)
- 3 phase without neutral (3ph)
- 2 phase (2ph+N)
- 1 phase (1ph+N)

Note: one of the four choices above has been factory programmed as per the client's specification.

□ 3 phase with neutral (3ph+N)

| | | |
|----------------------|----|------------|
| Phase | I1 | 542 |
| current | I2 | 543 |
| (Amps) | I3 | 536 |
| ext command=1 17:10 | | |
| gen running 12/01/00 | | |

- Press **I** to get the three phase currents:
I1 = current in phase 1
I2 = current in phase 2
I3 = current in phase 3

| | | |
|----------------------|----|-----------|
| Neutral | | |
| current | In | 23 |
| (Amps) | | |
| ext command=1 17:10 | | |
| gen running 12/01/00 | | |

- Press **I** again to get the neutral current:
In = current in the neutral
- Note : the neutral current is calculated by vector summation of the three phase currents..
- Press **I** again to bring up the first screen and so on ...

□ 3 phase without neutral (3ph)

| | | |
|----------------------|----|------------|
| Phase | I1 | 542 |
| current | I2 | 543 |
| (Amps) | I3 | 536 |
| ext command=1 17:10 | | |
| gen running 12/01/00 | | |

- Press **I** to get the three phase currents:
I1 = current in phase 1
I2 = current in phase 2
I3 = current in phase 3
- If you press **I** again, nothing changes.

□ 2 phase (2ph+N)

| | | |
|----------------------|----|------------|
| Phase | I1 | 246 |
| current | I2 | 238 |
| (Amps) | | |
| ext command=1 17:10 | | |
| gen running 12/01/00 | | |

- Press **I** to get the two phase currents:
I1 = current in phase 1
I2 = current in phase 2
- If you press **I** again, nothing changes.

□ 1 phase (1ph+N)

| | | |
|----------------------|----|-----------|
| Phase | I1 | 95 |
| current | | |
| (Amps) | | |
| ext command=1 17:10 | | |
| gen running 12/01/00 | | |

- Press **I** to get the 1 phase current :
I1 = 1 phase current
- If you press **I** again, nothing changes.

4.3. Frequency and hours counter

To view the generating set frequency and number of running hours, press the **F/8** button. Values are expressed in Hertz (Hz) and in hours respectively.

| | |
|----------------------|-------------|
| Frequency (Hz) | 50.2 |
| No hours | 643 |
| No minutes | 45 |
| ext command=1 17:10 | |
| gen running 12/01/00 | |

The minutes are counted from 0 to 59 minutes; on the 60th minute, the number of hours is incremented and the number of minutes goes to 0.

Example of "overview" screen showing frequency and number of generator running hours and minutes.

Note: a maximum of 32767 running hours can be displayed. The display is in whole hours.

5. VIEWING THE ENGINE PARAMETERS

To view the engine parameters, press the **Engine** button successively. Three different screens can be viewed. The values that can be displayed on these three screens are indications only.

❑ **Screen 1** : Press the **Engine** button to get the following screen.

| | |
|---------------|-------------|
| Fuel Lev(%) | 65 |
| E.Speed(RPM) | 1502 |
| Batt. (Volts) | 12.3 |
| ext command= | 17:15 |
| gen running | 12/01/00 |

- The first line indicates the fuel level, expressed in %, in the day tank.
- The second line indicates the engine speed expressed in RPM.
- The third line indicates the battery voltage expressed in Volts.

❑ **Screen 2** : Press **Engine** a second time to get the following screen.

| | |
|---------------|-----------|
| Oil Pr.(Bar) | 6 |
| Oil T.(°C) | 90 |
| WaterT.(°C) | 75 |
| ext command=1 | 17:15 |
| gen running | 12/01/00 |

- The first line indicates the oil pressure expressed in Bar.
- The second line indicates the oil temperature expressed in degrees Celsius (°C).
- The third line indicates the water temperature expressed in degrees Celsius (°C).

❑ **Screen 3** : Press **Engine** a third time to get the following screen.

| | |
|---------------|------------|
| Oil Pr. (PSI) | 90 |
| Oil T.(°F) | 194 |
| WaterT. (°F) | 167 |
| ext command=1 | 17:15 |
| gen running | 12/01/00 |

- The first line indicates the oil pressure expressed in PSI (pound per square inch).
- The second line indicates the oil temperature expressed in degrees Fahrenheit (°F).
- The third line indicates the water temperature expressed in degrees Fahrenheit (°F).

• Press **Engine** again to bring up the first screen and so on ...

The first screen is the one which appears by default after the has powered up (see paragraph 1.7) or after pressing **Esc** to exit the display mode.

- If one of the sensors is not declared available (optional sensor and/or factory programming), there will be no display on screen on the line corresponding to the undeclared sensor (see screen 1).
- If the cabling of one the analogue inputs is faulty or if a sensor is faulty, there will be no digital indication on screen on the line of the corresponding sensor (see screen 2).

| | |
|---------------|-----------|
| Oil Pr. (Bar) | 6 |
| WaterT. (°C) | 75 |
| ext command=1 | 17:15 |
| gen running | 12/01/00 |

screen 1

| | |
|---------------|-----------|
| Oil Pr. (Bar) | |
| Oil T.(°C) | 90 |
| WaterT.(°C) | 75 |
| ext command= | 17:15 |
| gen running | 12/01/00 |

screen 2

6. DISPLAY LEDS AND LAMP TEST

On the display module panel face, fifteen LEDs are used to display various generating set status, alarms and faults.

❑ A set of eight LEDs are used to display the following alarms, faults and statuses:



Oil pressure fault/shutdown (red)



Water temperature fault/shutdown (red)



Overcranking/Fail to start shutdown (red)



Overspeed fault/shutdown (red)



Genset ready to take load (green)



Charge alternator fault/shutdown (red)



General alarm (yellow)




General fault (red)

All these LEDs are identified by an ISO symbol. The last two LEDs are flashing lights. The " general fault " LED flashes on appearance of any fault and the " general alarm " LED flashes on appearance of any alarm.

❑ Each blue coloured function button (**Stop, Manu, Auto, Test**) is associated with a LED. The operation of these four LEDs is described in paragraph 2.

❑ The **0** and **1** buttons are each associated with a LED. The operation of these two LEDs is described in paragraph 18.

❑ The **ON** button is associated with a LED. This LED is used to display the powering up (see paragraphs 1.5 and 3.2).

Press the  button to light all the LEDs for six seconds. This is only possible on the " overview " type screens.

7. SCREEN CONTRAST

On the various " overview " type screens, the contrast of the characters displayed on screen can be adjusted via the ➡ and ⬅ buttons:

- Press ➡ to increase the contrast on screen
- Press ⬅ to reduce the contrast on screen.

Note: le The contrast obtained after using the ➡ and ⬅ button is not saved when if powered down. The only way the contrast value, modified by the ➡ and ⬅ buttons, can be saved is via the **Contrast** menu (see paragraph 15).

- Contrast adjustment is especially useful when is used in severe conditions (-15°C or +60°C).
- When temperature is above +60°C, the screen is very dark. It is therefore necessary to reduce the contrast by pressing ⬅.
- When temperature is below -15°C, the screen is very light. It is therefore necessary to increase the contrast by pressing ➡.

8. DISPLAYING THE ALARM AND FAULT MESSAGES

All alarms and faults are clearly viewed on screen. Two lines are dedicated for their display (see screens below).

8.1. Appearance of messages on screen

As soon as an alarm or fault appears, the electrical values and engine parameters are displayed on screen in a shortened form.

- The first alarm is displayed on screen over the first of the two lines (screen 1).
- The first fault is displayed on screen over the first of the two lines (screen 2).

| | | |
|----------------------|----------|-----|
| Ph./ph. | U12 | 400 |
| voltages | U23 | 401 |
| (Volts) | U31 | 398 |
| Alarm Low Fuel Level | | |
| ext command=1 | 17:30 | |
| gen stopped | 12/01/00 | |

screen 1

| | | |
|----------------------|----------|---|
| Ph./ph. | U12 | 0 |
| voltages | U23 | 0 |
| (Volts) | U31 | 0 |
| Fault Emergency Stop | | |
| ext command=1 | 17:32 | |
| gen stopped | 12/01/00 | |

screen 2

| | | |
|----------------------|----------|-----|
| Ph./ph. | U12 | 400 |
| voltages | U23 | 401 |
| (Volts) | U31 | 398 |
| Alarm Retention Bund | | |
| Alarm Low Fuel Level | | |
| ext command=1 | 17:35 | |
| gen stopped | 12/01/00 | |

screen 3

As soon as another alarm appears on screen 1, the first alarm message slides down to the second line and the message of the new alarm positions itself on the first line (see screen opposite).
(example : **Alarm Retention Bund**)

| | | |
|----------------------|----------|---|
| Ph./ph. | U12 | 0 |
| voltages | U23 | 0 |
| (Volts) | U31 | 0 |
| Fault Low Fuel Level | | |
| Fault Emergency Stop | | |
| ext command=1 | 17:38 | |
| gen stopped | 12/01/00 | |

screen 4

As soon as another fault appears on screen 2, the first fault message slides down to the second line and the message of the new fault positions itself on the first line (see screen opposite).
(example : **Fault Low Fuel Level**)

| | | |
|----------------------|----------|---|
| Ph./ph. | U12 | 0 |
| voltages | U23 | 0 |
| (Volts) | U31 | 0 |
| Fault Emergency Stop | | |
| Alarm Low Fuel Level | | |
| ext command=1 | 17:35 | |
| gen stopped | 12/01/00 | |

screen 5

If an alarm appears on screen 2, the fault message stays on the first line and the alarm message is displayed on the second line (see screen opposite).
(example : **Alarm Low Fuel Level**)
Priority is given to fault messages.

- If a fault appears on screen 3, the message on the second line disappears from the screen, the message on the first line slides down to the second line and the fault message takes the first line.
- If a third fault appears on screen 4, the message on the second line disappears from the screen, the message on the first line slides down to the second line and the third fault message takes the first line.
- If an alarm appears on screen 4, the message relating to that alarm will not appear.
- If a new alarm appears on screen 5, the message relating to that alarm will replace the alarm message on the second line.

8.2. Removing messages on screen

- If all the faults, displayed on screen or not, are no longer active (circuit-breaker pressed in, emergency stop unlocked, logical input inactive, connection restored, ...), press the **Reset** button to reset the last fault present on screen or in other words, the last recorded fault. This way, the previous fault(s) is/are moved forward one line.

The example below shows the screen changes with two faults displayed on screen and one fault not displayed but recorded. In order of appearance, the following faults are:

- Module 3 CAN
- Emergency stop
- Day tank low fuel level

The three faults are considered as no longer active (fuel level above low level, emergency stop unlocked, CAN connection restored on the option 3 module).

| | | |
|----------------------|----------|---|
| Ph./ph. | U12 | 0 |
| voltages | U23 | 0 |
| (Volts) | U31 | 0 |
| Fault Low Fuel Level | | |
| Fault Emergency Stop | | |
| ext command=1 | 17:45 | |
| gen stopped | 12/01/00 | |

Messages **Fault Low Fuel Level** and **Fault Emergency stop** are then displayed. Press **Reset** to reset the low fuel level fault (the message disappears).

| | | |
|----------------------|----------|---|
| Ph./ph. | U12 | 0 |
| voltages | U23 | 0 |
| (Volts) | U31 | 0 |
| Fault Emergency Stop | | |
| Fault module 3 CAN | | |
| ext command=1 | 17:46 | |
| gen stopped | 12/01/00 | |

The message **Fault module 3 CAN** then appears on the second line (see screen opposite). Press **Reset** to reset the emergency stop fault (the message disappears).

| | | |
|--------------------|----------|---|
| Ph./ph. | U12 | 0 |
| voltages | U23 | 0 |
| (Volts) | U31 | 0 |
| Fault module 3 CAN | | |
| ext command=1 | 17:47 | |
| gen stopped | 12/01/00 | |

The message **Fault module 3 CAN** then appears on the second line (see screen opposite). Press **Reset** to reset the emergency stop fault (the message disappears).

| | | |
|---------------|----------|---|
| Ph./ph. | U12 | ● |
| voltages | U23 | ● |
| (Volts) | U31 | ● |
| ext command=1 | 17:48 | |
| gen stopped | 12/01/00 | |

There are no more faults but is still in **Stop** mode. As the external command is still available, the operator must select the **Auto** mode for the generating set to restart automatically.

- An alarm message will automatically disappear when the alarm input is no longer in logical status 1.

9. DISPLAYING THE STATUS MESSAGES

All status relating to the operation of the generating set and its auxiliaries are clearly viewed on the two lower lines.

As well as the date and time, the operator will be able to view:

- Operating mode selected (**Stop**, **Manu**, **Auto**, **Test**)
- Water heater control logical status (active or inactive)
- External command logical status (0 or 1)
- built-in mains failure and mains return delays
- Generating set status (genset on stand-by, stopped or running)
- Engine preglow period
- Cranking period (with attempt number and starter number)
- Starter rest period between two starting attempts, with possible indication of engine preglow
- Starter tripping (indicating starter number)
- RPM and Volts stabilising period
- Authorisation to close the Stand-by contactor in **Manu** mode

- ATS toggle delay: Mains→Stand-by and Stand-by→Mains, and closure confirmation of the Mains and Stand-by contactors- Motorised C/B opening and closure
- Engine cooling down time in **Auto** mode
- Operating time in **Test** mode
- Delayed shutdown on water temperature fault or overload/short-circuit fault
- Appearance of commands ; EJP J-1, EJP advance warning, EJP start-up
- Clock activated operation indicating time range number
- Shutdown bypass via switch (complying with French standard NFC 61940))

The three screens below show three examples of status messages displayed over the two last lines.

| | |
|-------------------------------|-------------|
| Fuel Lev(%) | 45 |
| E.Speed(RPM) | 326 |
| Batt. (Volts) | 24.2 |
| starting attempt1 starter1 | |

Starting period: attempt 1 on starter 1

| | |
|-------------------------------------|-------------|
| Fuel Lev(%) | 40 |
| E.Speed(RPM) | 1502 |
| Batt. (Volts) | 24.2 |
| toggle delay stand-by->mains 05" | |

S→N toggle: Toggle from Stand-by contactor to Mains contactor in 5 seconds

| | |
|--|-------------|
| Fuel Lev(%) | 39 |
| E.Speed(RPM) | 1502 |
| Batt. (Volts) | 24.2 |
| cooling down eng. stops in: 03' 42" | |

Engine cooling down: Engine to stop in 3 minutes and 42 seconds in **Auto** mode

10. ACCESSING THE LEVEL 1 DISPLAY

Level 1 display enables the operator to view various data and to do a quick diagnostic on any generating set operating problem.

Press the **M** button to bring up the **GENERAL** screen indicating the software version implemented on the interface board CB or CB12.

| | |
|---|-----------|
| GENERAL (vers. 1.01A) V: Valid Esc: Exit | |
| ■ Control | o Config |
| o Alarm/ Flt | o Status |
| o Inputs | o Outputs |
| o Contrast | o Protect |
| o Ges | |

- The cursor ■ flashes over the o sign on the first line.
- Press → to move the cursor to the next sign on the right hand side, if possible, or to the next line.
- Press ← to move the cursor to the previous sign, if possible, or to the previous line.
- By pressing → or ←, the operator places the cursor over the required menu.
- Press V to access the selected menu (example: **Outputs** menu).

Menus **Control** and **Config** can only be accessed after entering a code on the keyboard

- Press **Esc** to return to the " overview " screen (see paragraph 1.7).
- If neither **V** nor **Esc** is pressed, the " overview " screen (see paragraph 1.7) appears after three minutes.

From the **GENERAL** screen, there is a selection of six menus. Their description is detailed below.

□ Alarm/Flt (see paragraph 11)

This menu is used to view the list of time and date stamped generating set alarms and faults.

□ Status (see paragraph 12)

This menu is used to view the list of time and date stamped generating set status.

□ Inputs (see paragraph 13)

This menu is used to view the logical status of all inputs on the mounted interface board (CB or CB12) and on option (3,4 and 5) modules if these are declared available.

□ Outputs (see paragraph 14)

This menu is used to view the logical status of all outputs on the mounted interface board (CB or CB12) and on option (3,4 and 5) modules if these are declared available.

□ Contrast (see paragraph 15)

This menu is used to change characters contrast on screen and to save the changes.

□ Protect (see paragraph 16)

□ Ges (see paragraph 17).

This menu is used to display the generating set "Operating report". This function is only effective for the generating sets satisfying French standards NFS61-940 and NFE 37-312.

In cases where the generating set is equipped with a differential protection (with communication) or with a constant insulation checking device (with communication), this menu is used to view the settings, fault current or insulation resistor.

Note: Press the **M** button for three seconds to bring up that same **GENERAL** screen, followed by the first welcome screen (see paragraph 1.6), where the language, date and time can be changed at any time.

This can only be done when the generating set is running. All engine protection shutdowns stay active while these two welcome screens are accessed. Generally, in all menus and submenus offered, if neither **V** or **Esc** is pressed the "overview" screen (see paragraph 1.7) appears after three minutes.

11. "ALARM/FLT" MENU

After validation using the **V** button, when the cursor **■** flashes over the **o** sign next to **Alarm/Flt**, the **ALARMS/FAULTS** screen appears as follows.

| ALARMS/FAULTS | |
|----------------------|-------------------|
| Esc: Exit | |
| 1■18h40m25s 12/01/00 | fault water temp. |
| 2 18h28m40s 12/01/00 | alarm water temp. |

- This screen is used to view the list of the time and date stamped alarms and faults.
- Any one screen can have up to two alarm and/or fault messages.

Each message on two lines comprises:

- One chronological number (from 1 to 50)
- Time (hour/minute/second) and date (day/month/year)
- Nature of the fault or alarm
- One asterisk (*) or dash (-) (see paragraph 11.1)

Fifty alarm and fault messages can be recorded into the interface board CB or CB12 memory. These messages cannot be erased. When the list is full (fifty messages), the fifty first message will make the first recorded message disappear and so on.

On screen, alarms and faults are displayed in real time. If the cursor flashes next to number **1** (top of list), the appearance of an alarm or fault is viewed straight away. If the cursor flashes next to a number other than **1**, the new alarm or fault can be viewed after pressing **←**, once or several time depending on the cursor position.

- Press **→** to view the list in ascending order (from number **1** to number **x**, **x** being the biggest number) or in other words, from the newest to the oldest message.
- Press **←** to view the list in descending order (from number **x** to number **1**, **x** being the biggest number) or in other words, from the oldest to the newest message.
- The messages are always displayed two at a time (see the two screens below). The left-hand side screen shows messages number **5** and **6**. The right-hand side screen shows messages number **6** and **7**, after button **→** was pressed.

| ALARMS/FAULTS | |
|----------------------|-------------------|
| Esc: Exit | |
| 5 18h40m25s 12/01/00 | fault water temp. |
| 6■18h28m40s 12/01/00 | alarm water temp. |

| ALARMS/FAULTS | |
|----------------------|----------------------|
| Esc: Exit | |
| 6■18h28m40s 12/01/00 | alarm water temp. |
| 7 17h25m35s 12/01/00 | alarm low fuel level |

11.1. Special features for a fault

Just to the right of the chronological number of a fault (number **x**), appears an asterisk or a dash alternately with the cursor.

- The asterisk (*) systematically appears as long as the fault is active (emergency stop not unlocked, breaker not reset, CAN bus disconnected, etc ...). This asterisk disappears as soon as the logical input associated with the fault is no longer active (logical status 0).
- A dash (-) will then replace the asterisk to inform the operator that the fault has not been reset via the **Reset** button (see also paragraph 8.2).

A fault not reset which gets to the end of the list (**x=50**), is repositioned to the top of the list (**x=1**) as soon as another event appears (alarm or fault). In this case, it will be time stamped again while repositioning itself to the top.

11.2. Special features for an alarm

If an alarm always changes status (going from 0 to 1, then from 1 to 0, etc ...) with a frequency of less than two minutes, it is then only recorded on the first occurrence and this for two minutes. After this period, the alarm is recorded again if it continues to change. However, keeps the alarm displayed on screen even if the alarm keeps on appearing and disappearing. If another alarm or fault appears between two activations of the alarm previously mentioned, the recording will be made twice.

11.3. Other special cases

For all faults which are not linked to the status change of a logical input, it will not be possible to see the asterisk change into a dash. Physically acknowledging the fault will not make the asterisk disappear and the dash appear. Press **Reset** to remove the asterisk and to acknowledge the fault.

The faults concerned by this specific management are:

- Module 3CAN
- Module 4CAN
- Low alternator frequency
- High alternator frequency
- Low alternator voltage
- High alternator voltage
- Low battery voltage

- High battery voltage
- Overcranking (fail to start)
- Overspeed
- Charge alternator

12. " STATUS " MENU

After validation using the **V** button, when the cursor **■** flashes over the **o** sign next to **Status**, the **STATUS** screen appears as follows.

| STATUS | |
|-----------|---|
| Esc: Exit | |
| 1■ | 16h50m54s 12/01/00 STOP Mode activated |
| 2 | 16h45m20s 12/01/00 AUTO Mode activated |

- This screen is used to view the list of the date and time stamped generating set status.
 - Any one screen can have up to two generating set status messages.
- Any stroke on the following buttons is considered as a status:
- Mode selection (**Stop, Manu, Auto, Test**)
 - ATS (Mains/Stand-by changeover) control (**0** and **1**) in **Manu** mode only
 - **ON** button.
- Also, the automatic power-up, automatic shutdown and logical status of option No 20 input on option 4 module (shutdown bypass, French standard NFC 61940) are considered as statuses.

Note: For the Test and Manu buttons, only the second stroke is taken into account (i.e. confirmation of the operating mode).

Each message comprises of:

- One chronological number (from 1 to 25)
- Time (hour/minute/second) and date (day/month/year)
- Nature of the status.

Up to twenty-five status messages can be recorded into the interface board CB or CB12 memory.

These messages cannot be erased. When the list is full (twenty-five messages), the twenty sixth message will make the first recorded message disappear and so on.

- Press **➡** to view the list in ascending order (from number **1** to number **x**, **x** being the biggest number) or in other terms from the newest to the oldest message.
- Press **⬅** to view the list in descending order (from number **x** to number **1**, **x** being the biggest number) or in other terms from the oldest to the newest message.
- The messages are always displayed two at a time (see the two screens below). The left-hand side screen shows messages number **1** and **2**. The right-hand side screen shows messages number **2** and **3**, after button **➡** was pressed.

| STATUS | |
|-----------|---|
| Esc: Exit | |
| 1 | 16h50m54s 12/01/00 STOP Mode activated |
| 2■ | 16h45m20s 12/01/00 AUTO Mode activated |

| STATUS | |
|-----------|---|
| Esc: Exit | |
| 2■ | 16h45m40s 12/01/00 AUTO Mode activated |
| 3 | 16h40m30s 12/01/00 MANU Mode activated |

13. " INPUTS " MENU

After validation using the **V** button, when the cursor **■** flashes over the **o** sign next to **Inputs**, the **INPUTS** screen appears as follows.

| INPUTS | |
|--|-------------|
| V: Valid Esc: Exit | |
| <div>0 Main board (CB)</div> <div>o Option 1 (CB1/CB12)</div> <div>o Option 2 (CB12)</div> <div>o Option 3 Module</div> <div>o Option 4 Module</div> | Exit 12) |
| <div>o Option 3 Module</div> <div>o Option 4 Module</div> <div>o Option 5 Module</div> | |

- 5 lines can be displayed at the same time on the screen.
- The cursor **■** flashes on the **o** sign of the first line.
- Press **➡** to move the cursor to the next line, unless the cursor is on the **Option 5 module**.
- Press **⬅** to move the cursor to the previous line, unless the cursor is on the **Main board (CB)**.
- Press **➡** or **⬅** to place the cursor on the desired display.
- Press **V** when the cursor flashes on the **o** sign of one of the 6 lines to display the logical status of the inputs on interface board CB or CB12, and the inputs on both option 3, 4 and 5 modules, as described below:
- The inputs are numbered on the first line and the **■** flashes on input 1.
 - The next two lines indicate the logical status (0 or 1), symbolized by an asterisk (*).
 - The last two lines indicate the cursor position and input wording.
 - This simple principle is used to display, in real time, how the system inputs change.

The option 5 module is simply module OPT34 configured as module 5. This module is programmed specifically for applications with engines using integrated control electronics (MTU and Cummins engines).

The selection parameter for this module already exists in software version 1.01B. However, a line has been added in the **INPUTS** and **OUTPUTS** screens to display the logical status of the inputs and outputs of the module in accordance with its programming.

□ Composition of the interface boards (logical inputs)

| CB12 BOARD |
|------------|
| CB BOARD |

- CB board
(11 inputs)
- CB12 board = CB board + option 1 + option 2
(11 inputs + 4 inputs + 12 inputs)

❑ Main board (CB)

| MAIN BOARD (CB) Esc: Exit |
|------------------------------|
| ■23456789 10 11 |
| 0: ***** * * |
| 1: |
| Input 1: |
| Oil Pressure Shutdown |

Logical status display of the inputs on interface board CB, i.e. the eleven inputs described in Section " Technical characteristics ".

Note: the eleven inputs are also available on interface boards CB12.

❑ Option 1 (CB1/CB12)

| OPTION 1 (CB1/CB12) Esc: Exit |
|----------------------------------|
| ■1234 |
| 0: **** |
| 1: |
| Input 1: |
| Oil Temp. Shutdown |

Logical status display of the inputs on option 1 part of interface board CB12, i.e. the four inputs described in Section " Technical characteristics ".

Note: the four inputs are also available on interface board CB12.

❑ Option 2 (CB12)

| OPTION 2 (CB12) Esc: Exit |
|------------------------------|
| ■23456789 10 11 12 |
| 0: ***** * * * |
| 1: |
| Input 1: |
| Diff. or C.I.C. trip |

Logical status display of the inputs on option 2 part of interface board CB12, i.e. the twelve inputs described in Section " Technical characteristics ".

❑ Option 3 Module

| OPTION 3 MODULE Esc: Exit |
|------------------------------|
| ■2345678 |
| 0:***** |
| 1: |
| Input 1: |
| EJP J-1 |

Logical status display of the inputs on option 3 module, i.e. the eight inputs described in Section " Technical characteristics ".

❑ Option 4 Module

| OPTION 4 MODULE Esc: Exit |
|------------------------------|
| ■2345678 |
| 0:***** |
| 1: |
| Input 1: |

Logical status display of the eight inputs on option 4 module. As these inputs can be programmed, the wording of each input varies according to the programming performed. For that reason, the wording does not appear on the screen opposite.

❑ Option 5 Module

| OPTION 5 MODULE Esc: Exit |
|------------------------------|
| ■2345678 |
| 0:***** |
| Input 1: |
| MTU oil pressure fault |

By setting parameter **901** to 1, the inputs of the option 5 module are displayed programmed with an MTU engine.

Display of logical status of inputs of option 5 module. For the MTU engine, only inputs 1, 2, 3, 4 and 5 are used.

| OPTION 5 MODULE Esc: Exit |
|------------------------------|
| ■2345678 |
| 0:***** |
| Input 1: |
| QST30 overspeed fault |

By setting parameter **902** to 1, the inputs of the option 5 module are displayed, programmed with Cummins engine QST30.

Display of logical status of inputs of option 5 module. For the QST30 engine, only inputs 1, 2 and 3 are used.

| |
|--|
| <div>OPTION 5 MODULE</div> <div>Esc: Exit</div> <div>12345678</div> <div>0:*****</div> <div>Input 1:</div> <div>General Alarm JDEC</div> |
|--|

By setting parameter **903** to 1, the inputs of the option 5 module are displayed, programmed with John Deere 6081HF engine.

Display of logical status of inputs of option 5 module. For the John Deere 6081HF engine., only inputs 1, 2 and 3 are used.

| |
|---|
| <div>OPTION 5 MODULE</div> <div>Esc: Exit</div> <div>12345678</div> <div>0:*****</div> <div>Input 1:</div> <div>Oil pressure Shutdown</div> |
|---|

By setting parameter **904** to 1, the inputs of the option 5 module are displayed, programmed with Volvo D12 engine.

Display of logical status of inputs of option 5 module. For the Volvo D12 engine, only inputs 1, 2 and 3 are used.

❑ Viewing the inputs on an option not available (see note) or on an option module not available (factory configuration) will result in the following superimposed message to be displayed.

| |
|--|
| <div>INPUTS</div> <div>V: Valid Esc: Exit</div> <div>o Main Board (CB)</div> <div>o Module Not Avail.</div> <div>o Esc: Exit</div> <div>o Option 4 Module</div> |
|--|

Example : a system is configured with interface board CB12 and Option 3 module. Press **V**, when the cursor is next to **Option 4 Module**, to display the superimposed message opposite.

Note: The availability of option 1 and option 2 (interface board CB12) parts is detected automatically as soon as is powered up.

Example: a system comprises of interface board CB. Press **V**, when the cursor is in front of **Option 2 (CB12)**, to make the previous screen appear.

14. " OUTPUTS " MENU

After validation using the **V** button, when the cursor **■** flashes over the **o** sign next to Outputs, the OUTPUTS screen appears as follows.

| | |
|--|-----------------------------------|
| INPUTS V: Valid Esc: Exit | |
| ■ Main board (CB) o Option 1 (CB12) o Option 2 (CB12) o Option 3 Module o Option 4 Module | Esc: Exit (CB12) |
| o Option 4 Module o Option 5 Module | |

- 5 lines can be displayed at the same time on the screen.
- The cursor **■** flashes on the **o** sign of the first line.
- Press **→** to move the cursor to the next line, unless the cursor is on the **Option 5 module**.
- Press **←** to move the cursor to the previous line, unless the cursor is on the **Main board (CB)**.
- Press **→** or **←** to place the cursor on the desired display.
- Press **V** when the cursor flashes on the **o** sign of one of the 6 lines to display the logical status of the outputs on interface board CB or CB12, and the outputs on both option 3, 4 and 5 modules, as described below:
 - The outputs are numbered on the first line and the **■** flashes on output 1.
 - The next two lines indicate the logical status (0 or 1), symbolized by an asterisk (*).
 - The last two lines indicate the cursor position and output wording.

This simple principle is used to display, in real time, how the system inputs change.

The option 5 module is simply module OPT34 configured as module 5. This module is program-

med specifically for applications with engines using integrated control electronics (MTU and Cummins engines).

The selection parameter for this module already exists in software version 1.01B. However, a line has been added in the INPUTS and OUTPUTS screens to display the logical status of the inputs and outputs of the module in accordance with its programming.

□ Composition of the interface boards (logical outputs)

| |
|--|
| CB12 BOARD CB BOARD |
|--|

- CB board
(7 outputs)
- CB12 board = CB board + option 1 + option 2
(7 outputs + 3 outputs + 2 outputs)

□ Main board (CB)

| |
|--|
| MAIN BOARD (CB) Esc: Exit |
| ■234567 0: ***** 1: Output 1: Fuel Solenoid Control |

Logical status display of the outputs on interface board CB, i.e. the seven outputs described in Section " Technical characteristics ".

Note: the seven outputs are also available on interface boards CB12.

□ Option 1 (CB1/CB12)

| |
|---|
| OPTION 1 (CB1/CB12) Esc: Exit |
| ■23 0: *** 1: Output 1: Air Damper Control |

Logical status display of the outputs on option 1 part of interface board CB12, i.e. the three outputs described in Section " Technical characteristics ".

Note: the three outputs are also available on interface board CB12.

□ Option 2 (CB12)

| |
|--|
| OPTION 2 (CB12) Esc: Exit |
| ■2 0: ** 1: Output 1: Fuel Pump Control |

Logical status display of the outputs on option 2 part of interface board CB12, i.e. the two outputs described in Section " Technical characteristics ".

□ Option 3 Module

| |
|---|
| OPTION 3 MODULE Esc: Exit |
| ■23456789 10 0: ***** * 1: Output 1: |

Logical status display of the ten outputs on option 3 module.

As these outputs can be programmed, the wording on each line varies according to the programming performed. For that reason, the wording does not appear on the screen opposite.

❑ Option 3 Module

| |
|------------------------------|
| OPTION 3 MODULE Esc: Exit |
| ■23456789 10 |
| 0: ***** * |
| 1: |
| Output 1: |

Logical status display of the ten outputs on option 3 module.
As these outputs can be programmed, the wording on each line varies according to the programming performed. For that reason, the wording does not appear on the screen opposite.

❑ Option 4 Module

| |
|------------------------------|
| OPTION 4 MODULE Esc: Exit |
| ■23456789 10 |
| 0: ***** * |
| 1: |
| Output 1: |

Logical status display of the ten outputs on option 4 module.
As these outputs can be programmed, the wording on each line varies according to the programming performed. For that reason, the wording does not appear on the screen opposite.

❑ Option 5 Module

By setting parameter **901** to 1, the inputs of the option 5 module are displayed, programmed with an MTU engine.

| |
|------------------------------|
| OPTION 5 MODULE Esc: Exit |
| ■2345678910 |
| 0: ***** * |
| Input 1: |
| Start order GE |

Display of logical status of outputs of option 5 module. For the MTU engine, only outputs 1, 2, 3, 4 and 5 are used.

By setting parameter **902** to 1, the outputs of the option 5 module are displayed, programmed with Cummins engine QST30.

| |
|------------------------------|
| OPTION 5 MODULE Esc: Exit |
| ■2345678910 |
| 0: ***** * |
| Input 1: |
| Reset ECM |

Display of logical status of outputs of option 5 module. For the QST30 engine, only output 1 is used.

By setting parameter **903** to 1, the outputs of the option 5 module are displayed, programmed with John Deere 6081HF engine.

| |
|------------------------------|
| OPTION 5 MODULE Esc: Exit |
| ■2345678910 |
| 0: ***** * |
| 1 |
| Input 9: |
| Diagnostic J D |

Display of logical status of outputs of option 5 module. For the John Deere engine, only output 9 is used.

(*) If there is a problem with current consumption, use output relay #9 as this supports more than 2.5A. The 'Diagnostic' input on the JDEC electronics card needs a more current than 1A.

By setting parameter **904** to 1, the outputs of the option 5 module are displayed, programmed with Volvo D12 engine.

| |
|------------------------------|
| OPTION 5 MODULE Esc: Exit |
| ■2345678910 |
| 0: ***** * |
| 1 |
| Input 1: |
| Start Order GE |

Display of logical status of outputs of option 5 module. For the Volvo D12 engine, only ioutputs 1, 2, 3 and 4 are used.

❑ Viewing the outputs on an option not available (see note) or on an option module not available (factory configuration) on the cabled system will result in the following superimposed message to be displayed.

| OUTPUTS | |
|----------------------|-------------------|
| V: Valid Esc: Exit | |
| o Main board (CB) | |
| o | Module Not Avail. |
| o | Esc: Exit |
| o Option 4 Module | |

Example: a system is configured with interface board CB12 and Option 3 module. Press **V**, when the cursor is next to **Option 4 Module**, to display the superimposed message opposite.

Note: The availability of option 1 and option 2 (interface board CB12) parts is detected automatically as soon as is powered up.
Example : a system comprises of interface board CB. Press **V**, when the cursor is in front of **Option 2 (CB12)**, to make the previous screen appear.

15. " CONTRAST " MENU

After validation using the **V** button, when the cursor ■ flashes over the o sign next to **Contrast**, the **CONTRAST** screen appears as follows.

| CONTRAST | |
|--------------------|-------|
| Esc: Exit | |
| <- down | up -> |
| Current Value: 148 | |
| Adjust contrast | |
| Min Value | : 1 |
| Max Value | : 250 |

- This screen is used to adjust the contrast of the characters displayed. Also, when the contrast value has been changed, only through this screen can the new value be saved in case is powered down.
- Press ➡ to increase the contrast
- Press ⬅ to reduce the contrast
- The contrast is increased or decreased in steps of 1 (... , 140, 141, 142, ...).
- The contrast value which is modified by the ➡ and ⬅ buttons changes on screen, thus enabling you to efficiently locate the contrast area. This area varies according to ambient temperature.
- Press **Esc** to exit this screen, the contrast is then saved into memory, the **GENERAL** screen appears and the cursor flashes over the o sign next to **Contrast**.

16. " PROTECT " MENU

If a protection of differential type (differential relay) or via constant insulation check (C.I.C.) is cabled to interface board CB12, this menu is used to view the parameters inherent in each protection. These parameters can only be viewed if the relays (differential or insulation check) are equipped with a specific communication.

After validation using the **V** button, when the cursor ■ flashes over the o sign next to **Protect**, one of the two screens below appears, depending on the protection selected (factory configuration).

16.1. Differential protection

The " Resys M " type relay will do this function. Differential protection is used in TT neutral systems (neutral linked to earth). When the cursor flashes over the o sign next to **Protect**, the **DIFF. PROTECTION** screen below then appears.

| DIFF. PROTECTION | |
|-----------------------|--|
| Esc: Exit | |
| Delay Setting: 000ms | |
| Alarm Relay Status: 0 | |
| Toroid Connection : 0 | |
| Fault Current: 000,0% | |

- **Delay Setting** indicates the trip time on a differential fault.
- **Alarm Relay Status** takes two values 0 or 1 and indicates the alarm relay physical status.
- **Toroid Connection** takes two values 0 or 1 and indicates the connection status of the core balance transformer.
- **Fault Current** indicates the % value of the fault current.

- The delay setting can be displayed between 0 and 10 seconds, with:
 - a display in milliseconds between 0 and 100ms
 - a display in seconds above 100ms
 - The fault current percentage displayed varies according to the relay initial setting.
- Example: relay set to 300mA, fault current=150mA, the screen display will be of 50%.

16.2. Protection via CIC

The " Isom AS " type relay will do this function. Protection via permanent insulation check is used in IT neutral systems (impedant or insulated neutral). When the cursor flashes over the **o** sign next to **Protect**, the **CONSTANT INSUL CHECK** screen below is displayed.

| |
|------------------------------------|
| CONSTANT INSUL.CHECK |
| Esc: Exit |
| Insulation Resistor : 000 kOhms |

- **Insulation Resistor** indicates the real time insulation level in the circuit.

16.3. Special case

In cases where the user installs a differential protection relay or a constant insulation checking device different from those offered, will not be able to display the feedback data from these various relays. Therefore, access to **Protect** menu will not be possible.

17. GENERATING SET OPERATION

17.1. Water heater

If the engine is equipped with a water heater, will need to be in **Auto** mode for the water heater to operate. The water heater can be stopped in two ways:

- via the thermostat mounted on the engine
- via the fuel stop solenoid when energised.

| | |
|---------------|----------|
| Fuel Lev(%) | 65 |
| E.Speed(RPM) | 0 |
| Batt. (Volts) | 24.2 |
| water heater | 17:20 |
| gen stand-by | 12/01/00 |

- A message appears on the screen opposite when the water heater is activated. This message is displayed alternately with message **ext command=0**.
- As soon as the generating set starts, the message **water heater** will no longer appear.

17.2. Engine preglow

Some engines are equipped with an air intake heating glow plug enabling easier start-up in cold weather. As factory programming was carried out, the engine preglow output will be activated at the beginning of any start-up sequence (see screen 1). This preglow period can be adjusted (factory programmed). Engine preglow is also active between two start-up attempts. However, the operating time is equal to the interval between two attempts (see screen 2).

| | |
|----------------|------|
| Fuel Lev(%) | 65 |
| E.Speed(RPM) | 0 |
| Batt. (Volts) | 24.2 |
| engine preglow | |

screen 1

| | |
|---|------|
| Fuel Lev(%) | 65 |
| E.Speed(RPM) | 0 |
| Batt. (Volts) | 24.2 |
| engine preglow rest between attempts | |

screen 2

17.3. Fuel solenoid control

The fuel solenoid control activation is interlocked with the engine preglow control or starter control activation. The fuel solenoid supply is then permanent. It is interrupted when the engine shutdown is requested (**Stop** button pressed, normal shutdown in **Auto** mode, emergency stop pressed, shutdown on any fault).

17.4. Starter control

- On appearance of the external command (immediate or associated with the end of the power failure delay) or at the end of the engine preglow period, the starter is cranked for an adjustable time (factory programmed). The following can happen:

- ① The engine cranks sufficiently to start
- ② The whole attempt is not sufficient to start the engine

In the first instance, the starter trips (see paragraph 17.5). In the second instance, the starter automatically trips at the end of the starting attempt and for an adjustable time (factory programmed). At the end of the preset number of attempts, if the engine has not started, the over-cranking fault appears on screen.

- Several choices are possible at the start-up level (factory programmed) :

- One electrical starter (simple start)
- Two electrical starters (twin start)
- One electrical starter and one pneumatic starter (twin start)
- Consecutive start (1)
- Alternated start (2)

In case (1), activates x times starter 1 output, then activates y times starter 2 output (x is starter 1 number of attempts and y is starter 2 number of attempts).

In case (2), alternately activates the two starter outputs up to the biggest of the two values entered in memory (x or y).

x = starter 1 number of attempts

y = starter 2 number of attempts

Below, two screen examples showing the starters activation.

| | |
|---------------------------------|-------------|
| Fuel Lev(%) | 65 |
| E.Speed(RPM) | 0 |
| Batt.(Volts) | 24.2 |
| starting attempt 1 starter 1 | |

screen 1

| | |
|---------------------------------|-------------|
| Fuel Lev(%) | 65 |
| E.Speed(RPM) | 0 |
| Batt. (Volts) | 24.2 |
| starting attempt 3 starter 2 | |

screen 2

17.5. Starter tripping

If the engine starts, the starter control output is automatically tripped when the engine reaches the set threshold (factory programmed):

- For an electrical starter
- For a pneumatic starter

17.6. RPM and Volts stabilisation

- Stabilisation is a normal physical phenomenon in any regulation system. When the engine reaches the (electrical or pneumatic) starter tripping threshold, the engine speed and alternator voltage stabilisation process is launched. When the delay elapses (factory programmed) and if the low frequency and low alternator voltage thresholds are reached, the green LED comes on. This light tells the operator that the Stand-by contactor or motorised C/B can be manually controlled. In the case of an **Auto** mode operation, the LED coming on activates the Stand-by contactor delayed closure (see paragraph 18).
- If the green LED does not come on, an alarm or fault will be signalled at the end of one of the four following delays: low frequency, high frequency, low alternator voltage, high alternator voltage.
- During operation, if the green LED goes out, this means that the generating set no longer operates within one of the two intervals:
 - Low/high frequency
 - Low/high alternator voltage

The appearance of an alarm or fault (depending on the configuration) will be displayed on screen.

17.7. Generating set output

- In **Auto** mode, when the Stand-by contactor is closed, the generating set delivers the installation.
- In **Manu** mode and without ATS, as soon as the green LED comes on, the generating set can deliver the installation. The operator must then manually close the output circuit breaker mounted on the generating set.

When the generating set delivers the installation, the screen below appears.


| | | |
|---------------|----------|------------|
| Phase | I1 | 425 |
| current | I2 | 420 |
| (Amps) | I3 | 436 |
| ext command=1 | 17:10 | |
| gen running | 12/01/00 | |

- The message on the last line indicates that the genset delivers the installation. The output is easily checked by viewing the currents in each phase.

17.8. Engine cooling down and shutdown

Engine cooling down and shutdown are triggered in three different ways; in **Manu** mode, in **Auto** mode, in **Test** mode.

- In **Manu** mode, the operator opens the Stand-by contactor by pressing the **0** button (if there is an ATS) or cuts off the load by manually opening the generating output circuit-breaker. The operator must then let the engine run for a few minutes to let it cool down, before pressing **Stop**.

| | |
|---|--|
|  | The cooling down phase is required in Manu mode |
|---|--|

- In **Auto** mode, when one of the three start-up conditions changes (see paragraph 2.3), the Stand-by contactor opens automatically, the Mains contactor closes after the S&M toggle delay and the engine enters into a cooling down phase. At the end of the cooling down period, the engine stops and the generating set is on stand-by again.
- In **Test** mode, at the end of the **Test** mode operation delay (screen display), the generating set stops instantly without any cooling down period as the **Test** mode is a no-load operation.

Note: when a fault appears, the engine shutdown is immediate or delayed depending on the nature of the fault and the factory programming.

18 GES OPERATION

| GES unit | |
|-------------------|------------|
| Esc : Exit | |
| Nbr hours/normal: | 5 hours 39 |
| Min. | |
| Nbr hours/fault: | 0 hours 41 |


By selecting the **GES** menu using the → key, the **GES** unit screen is displayed:

- The first line indicates the generating set running time in normal operation.
- The second line indicates the generating set running time with safety features inhibited.
- Press **Esc** to return to the **GENERAL** screen.

19. ATS OPERATION

The ATS (or Mains/Stand-by changeover switch) is used to perform the automatic switching of energy sources when the main source (the mains) fails.

- In the factory standard configuration, the operator is informed of the Mains and Stand-by contactors position on the display module panel face (LEDs for **0** and **1** buttons):
 - Stand-by contactor closed
 - Mains contactor closed
- However, if the user does not cable the Mains and Stand-by contactors auxiliary contacts, the LEDs for buttons **0** and **1** will never come on and the following messages will continuously appear:
Alarm Mains open
Alarm Stand-by open
- If the user does not want to cable the contactors feed back data, the setups will have to be changed (consult the agent or technical support team).

 In this case, all messages associated with the Mains/Stand-by changeover operation will be displayed.

- The operations described below are valid with an ATS from our range and with the factory standard configuration.

19.1. In Stop mode

| | |
|---------------|-------------|
| Fuel Lev(%) | 65 |
| E.Speed(RPM) | 0 |
| Batt. (Volts) | 24.2 |
| ext command=1 | 17:06 |
| gen stopped | 12/01/00 |

When is positioned in **Stop** mode, the Mains contactor is closed (mains available) and the **0** button LED is lit. The Mains contactor control on interface board CB or CB12 is idle (contact closed).

- If the mains disappears, the Mains contactor opens, its auxiliary contact opens too, the screen opposite appears and the general alarm LED flashes.
- The message **ext command=1** appears on screen as soon as the external command input is active.
- The operator must select the **Auto** mode for the generating set to be able to start.

19.2. In automatic mode

When is positioned in **Auto** mode, the Mains contactor is closed (mains available), the **0** button LED is lit. The Mains contactor control on interface board CB or CB12 is idle (contact closed).

If the mains disappears, the Mains contactor opens, its auxiliary contact opens too, the external command input is activated and one of the two screens below appears.

| | |
|------------------------------|------|
| Fuel Lev(%) | 65 |
| E.Speed(RPM) | 0 |
| Batt. (Volts) | 24.2 |
| Alarm mains open | |
| starting attempt 1 starter 1 | |

screen 1

| | |
|------------------|------|
| Fuel Lev(%) | 65 |
| E.Speed(RPM) | 0 |
| Batt. (Volts) | 24.2 |
| Alarm mains open | |
| ext command=1 | |
| mains failure: | 05" |

screen 2

- Screen 1 means that the mains failure delay is set to 0 or that type 1 starting mode has been selected (built-in mains failure delay is ignored). The generating set begins its automatic starting phase.
- Screen 2 means that the generating set is going to start after the built-in mains failure delay (type 2 starting mode).

Whatever the screen (1 or 2), the message **Alarm Mains open** is displayed and the **0** button LED flashes, telling the operator that the Mains contactor is in a transitional status. The LED stops flashing and the message disappears as soon as the green LED comes on.

Note: The Mains contactor opening control is activated, thus avoiding it from closing if the mains returned.

| | | |
|------------------|-----|------------|
| Ph./ph. | U12 | 399 |
| voltages | U23 | 400 |
| (Volts) | U31 | 398 |
| toggle delay | | |
| mains->stand-by: | 05" | |

- The screen opposite indicates the delay for the Mains contactor to toggle to the Stand-by contactor.
- When the delay elapses, the Stand-by contactor closure is requested, the message **Stand-by closed** appears, the **1** button LED comes on and the genset then delivers the installation (see paragraph 17.7).

| | | |
|---------------|---------|------------|
| Phase | I1 | 425 |
| current | I2 | 420 |
| (Amps) | I3 | 436 |
| ext command=0 | | |
| mains return: | 00' 60" | |

- When the external command disappears, the mains return delay begins (if type 2 selected) and the screen opposite appears.
- When the mains return delay elapses, the Stand-by contactor opens and the **1** button LED goes out.

| | | |
|------------------|-----|---|
| Phase | I1 | ● |
| current | I2 | ● |
| (Amps) | I3 | ● |
| toggle delay | | |
| stand-by->mains: | 05" | |

- The message on the screen opposite appears to indicate that the Mains contactor will close in x seconds.
 - When the delay elapses, the Mains contactor closure is requested, the message **Mains closed** appears, the **0** button LED comes on and the mains delivers the installation again.
- Note 1: in cases where the contactors feed back data is ignored, the toggling messages from one contactor to the other (M→S and S→M) do not appear.
- Note 2: in cases of a type 1 start (the control unit built-in mains return delay ignored), the message **mains return: 00' 60"** on the previous screen does not appear.

19.3. In manual mode

- The ATS can only operate in **Manu** mode when the green LED is lit.
- Press button **1** to close the Stand-by contactor. Before the Stand-by contactor closes, the Mains contactor opens, the **0** button LED goes out and the message of toggling from Mains to Stand-by appears. When the delay elapses, the Stand-by contactor closure is effective, the message **Stand-by closed** appears and the **1** button LED comes on.
- Press button **0** to open (instantly) the Stand-by contactor, the **1** button LED goes out and the message of toggling from Stand-by to Mains appears. When the delay elapses, the Mains contactor closes automatically, the message **Mains closed** appears and the **0** button LED comes on.

APPENDIX - SOFTWARE VERSION 1.05E: "INTERNATIONAL" LANGUAGE

1 - Introduction

Software version 1.05E used with interface boards CB and CB12 enable you to use the MICS Telys in a language which is different from the four standard languages already implemented. This language is based on the use of pictograms. Compatibility is ensured with the old interface boards. This means it is possible to reprogram, on site, an interface board having software index 1.01B or 1.04D with a software having an index 1.05E. However, use of a software version 1.05E requires a display defined for software version 1.2 (see paragraph 2).

2 - Starting up the MICS Telys

When the MICS Telys is powered up, the initialization screen indicates the display software version.



The initialization phase takes no more than 5 seconds.

Note: A display flashed to version 1.2 can be used with no problem with an interface board version 2.01B or 1.04D.

Next, the language selection screen is displayed. The cursor flashes by default on "International". If no action is taken while the four squares are displayed in the small overlaid window, the MICS Telys automatically goes to the international language.

| LANGUAGE SELECTION | |
|--------------------|--|
| V: Valid Esc: Exit | |
| ■ International | |
| ○ French | |
| ○ English | |
| ○ Spanish | |
| ○ Portugues | |

You then have around 6 seconds to change the language by pressing the ➔ button then the **V** or **Esc** (*) buttons.

(*) By pressing the **V** button, the selected language is stored, meaning that the next time the unit is powered up, the cursor will automatically go to the previously selected language. In addition, by pressing the **V** button,

the system goes to the next screen to modify the date and time.

(*) If you press the **Esc** key, the selected language is not stored in memory. The next time the unit is powered up, the cursor will automatically be positioned on the international language.

3 - Modifying display with international language

- When the international language is selected on power up or during use:
- The time and date are no longer displayed on the screen. The time-stamped record of alarms, faults and statuses is however preserved.
 - The comfort messages described in paragraph 9 of the user instructions manual, levels 1, 2 or 3, disappear. These messages are displayed on the last two lines of the screen.
 - The alarms and/or faults are no longer displayed in plain language on the screen on the two lines located directly above the comfort messages, but are displayed in the form of codes in place of the time and date (see list of codes in paragraph 6).
 - When an alarm or fault appears, the size of the electrical and mechanical value displays are not compressed.
 - The programming display screens are accessed in the same way, the only difference is that all the screens are systematically in English.

4 - Display of electrical values

To facilitate understanding, the electrical values are not represented by pictograms.

- Press the **U/V** button to display the line voltages and the single voltages by pressing the button successively.

The notations such as **U12**, **U23**, **U31**, etc. are preserved. For more information concerning the meaning of the notations, refer to the user paragraph 4.1. The Volt is the unit of measurement for the electrical voltages at the alternator terminals (screen display: **Volts**).

| | |
|-------------|-----|
| (Volts) U12 | 399 |
| (Volts) U23 | 400 |
| (Volts) U31 | 398 |

- Press the **I** button to display the phase currents and the neutral current by pressing the button successively.

The notations such as **I1**, **I2**, **I3**, **In**, etc. are preserved. For more information concerning the meaning of the notations, refer to the user paragraph 4.2.

| | |
|-----------|-----|
| (Amps) I1 | 250 |
| (Amps) I2 | 264 |
| (Amps) I3 | 275 |



The Ampere is the unit if measurement of the currents output by the alternator (screen display: **Amps**).

| | |
|-----------|----|
| (Amps) In | 22 |
|-----------|----|

- Press the **F/8** key to display the generating set frequency and running hours and minutes.

Hz is the abbreviation for **Hertz**. Symbols 1 and 2 are represented in the table below.

| | |
|-----------------|------|
| (Symbol 1) (Hz) | 50.2 |
| (Symbol 2) | 643 |
| (Symbol 2) | 45 |

| Symbol number | Pictogram | Description |
|-------------------------|---|---|
| Symbol 1 (sinewave) |  | frequency of voltage output by alternator |
| Symbol 2 (hourglass) |  | number of generating set running hours and minutes |

5 - Display of mechanical values

By pressing the Engine button successively, the following is displayed: oil pressure, water temperature, oil temperature, battery voltage, engine speed and fuel remaining in daily tank.

| | |
|--------------------|-------------|
| (symbol 3) (%) | 50 |
| (symbol 4) (RPM) | 1500 |
| (symbol 5) (Volts) | 24.2 |

The notations: %, RPM and Volts are preserved. For more information on the meaning of the notations, refer to the user paragraph 5.







| | |
|-------------------|-----------|
| (symbol 6) (Bars) | 6 |
| (symbol 7) (°C) | 90 |
| (symbol 8) (°C) | 75 |

The notations: Bars and C° are preserved. For more information on the meaning of the notations, refer to the user paragraph 5.

A third screen can be accessed using the **Engine** button with Anglo-Saxon notations for the oil pressure (PSI), the water temperature (°F) and the oil temperature (°F).

Note: if the oil temperature is not selected (Sensors menu) or if the analog pack has not been selected, the symbol(s) will not appear on the screen.

All the symbols related to the engine parameters are represented in the table below.

| Symbol number | Pictogram | Description |
|--|---|---------------------------|
| Symbol 3 (fuel pump) |  | Fuel level in daily tank |
| Symbol 4 (galvanometer) |  | Engine speed |
| Symbol 5 (generating set battery) |  | Battery voltage |
| Symbol 6 (oil can) |  | Engine oil pressure |
| Symbol 7 (thermometer with oil drop) |  | Engine oil temperature |
| Symbol 8 (thermometer with cooling fluid level) |  | Cooling fluid temperature |

6 - Other symbols

■ Loss of system voltage (symbol 9)

Loss of the system voltage (or loss of mains) is represented on the screen by a crossed-out transformer. The micro-cutout time-delay (parameter 103 of **Timing** menu) is displayed next to this symbol and decrements automatically from the adjustment setting to 0.



| | |
|--------------------|-------------|
| (symbol 3) (%) | 50 |
| (symbol 4) (RPM) | 0 |
| (symbol 5) (Volts) | 24.2 |
| (symbol 9) : 12" | |

Example of screen showing system voltage is no longer available. 12 seconds remain prior to startup of the generating set (micro-cutout time delay).

■ Return of system voltage (symbol 10)

Return of the system voltage (or mains voltage) is represented on the screen by a transformer. The mains return time delay (parameter 104 of Timing menu) is displayed next to this symbol and decrements automatically from the adjustment setting to 0.



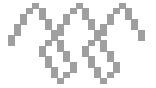
Example of screen showing system voltage is again available. Two minutes and fifteen seconds remain prior to automatic switchover from the generating set to the system (mains return time delay).

| | |
|----------------------|------------|
| (Amps) 11 | 645 |
| (Amps) 12 | 680 |
| (Amps) 13 | 653 |
| (symbol 10) : 2" 15" | |

Note: The two previous symbols can only be displayed provided the type 2 control parameter is at 1 (see user paragraph 2.1.1).

■ Spark plug preheating (symbol 11)

If the generating set is ready to be started on an external command and if the "spark plug preheating" parameter is set to 1 (Factory menu), a symbol representing a solenoid appears on the screen during the spark plug preheating period prior to the first startup and also between two startup attempts.



Example of screen showing that spark plug preheating is in operation; generating set will start in a few seconds.

| | |
|--------------------|-------------|
| (symbol 3) (%) | 50 |
| (symbol 4) (RPM) | 0 |
| (symbol 5) (Volts) | 24.2 |
| (symbol 11) | |

■ Engine cooling (symbol 12)

When the mains return time delay is completed, the emergency contactor opens, the normal contactor closes and the engine begins its cooling period which is displayed by the symbol shown opposite. The

cooling time delay (parameter 10 of timing menu) is displayed next to the symbol and decrements automatically from the adjustment setting to 0.



Example of screen showing that three minutes and ten seconds remain for cooling of the generating set prior to complete shut-down.

| | |
|----------------------|------------|
| (Volts) U12 | 399 |
| (Volts) U23 | 400 |
| (Volts) U31 | 398 |
| (symbol 12) : 3" 10" | |

7 - Alarms and fault codes

The alarms and faults are displayed on the right hand side of the two lower lines. As a general rule, a fault or alarm is displayed on the screen as follows:

XX-Y XX is a number between 00 and 99

Y takes two values: 0 to indicate an alarm, 1 to indicate a fault (same method used in **Options menu**).

Special case 1: for a single number, it is possible to display: XX-0 or XX-1. This means that the **Options** menu must be programmed to have one or the other on the screen.

Special case 2: if the alarm or fault are possible at the same time (two different sensors used on engine), the XX numbers are different (example: engine oil pressure fault = 02-1, engine oil pressure alarm = 64-0).

Note: When the word "impossible" appears in the table on the following page, this means that the alarm or fault does not exist (example: generating set emergency stop only managed for fault and not for alarm).

| | |
|--------------------|-------------|
| (symbol 3) (%) | 50 |
| (symbol 4) (RPM) | 0 |
| (symbol 5) (Volts) | 24.2 |
| | 06-1 |

Example of screen showing "overload or short-circuit" fault designated 06-1.

| | |
|-------------|------------|
| (Volts) U12 | 380 |
| (Volts) U23 | 382 |
| (Volts) U31 | 381 |
| | 12-0 |

Example of screen showing "alternator min voltage" alarm designated 12-0.

| | |
|--------------------|-------------|
| (símbolos 3) % | 50 |
| (símbolos 4) RPM | 0 |
| (símbolos 5) Volts | 24.2 |
| | 00-1 |
| | 08-0 |

Example of screen showing "max. battery voltage" alarm designated **08-0** and "emergency stop" fault designated **00-1**.

The alarms and faults are displayed in the same way as for versions 0.01B and 1.04D:

- Up to two codes (max.) displayed on screen
- Fault takes priority over alarm
- Faults are reset in order of appearance

For more details, refer to paragraph 8.

All the alarms and faults which can appear on the MICS Telys screen are listed in the table below.a.

| Wording | Alarm | Fault | Generated on |
|--|--------------|--------------|---------------------|
| Generator set emergency stop | impossible | 00-1 | CB, CB12 |
| External emergency stop | impossible | 01-1 | CB, CB12 |
| Engine oil pressure | impossible | 02-1 | CB, CB12 |
| Engine water temperature | impossible | 03-1 | CB, CB12 |
| Daily fuel tank level low | 04-0 | 04-1 | CB, CB12 |
| Radiator water level low | impossible | 05-1 | CB, CB12 |
| Alternator overload or short -circuit | 06-0 | 06-1 | CB, CB12 |
| Engine overspeed | impossible | 07-1 | CB, CB12 |
| Min. battery voltage | 08-0 | 08-1 | CB, CB12 |
| Max. battery voltage | 09-0 | 09-1 | CB, CB12 |
| Lithium battery absent | 10-0 | impossible | CB, CB12 |
| Generator set no start | impossible | 11-1 | CB, CB12 |
| Min. alternator voltage | 12-0 | 12-1 | CB, CB12 |
| Max. alternator voltage | 13-0 | 13-1 | CB, CB12 |
| Min. alternator frequency | 14-0 | 14-1 | CB, CB12 |
| Max. alternator frequency | 15-0 | 15-1 | CB, CB12 |
| Option 3 module CAN bus | impossible | 16-1 | CB, CB12 |
| Option 4 module CAN bus | impossible | 17-1 | CB12 |
| Option 5 module CAN bus | impossible | 18-1 | CB12 |
| Option 6 module CAN bus | impossible | 19-1 | CB12 |
| Spare | | | |
| RS485 communication | 21-1 | impossible | CB, CB12 |
| Hardware watchdog | impossible | 22-1 | CB, CB12 |
| Spare | | | |
| Spare | | | |
| Normal contactor open (system side) | 25-0 | impossible | CB, CB12 |
| Emergency contactor open (generating set side) | 26-0 | impossible | CB, CB12 |
| Oil temperature | impossible | 27-1 | CB, CB12 |
| Oil level low | impossible | 28-1 | CB12 |
| No water preheating | 29-0 | 29-1 | CB12 |
| Differential trigger | 30-0 | 30-1 | CB12 |
| Permanent insulation monitor trigger | 31-0 | 31-1 | CB12 |
| Differential relay connection | impossible | 32-1 | CB12 |
| Permanent insulation monitor connection | impossible | 33-1 | CB12 |
| Battery charger fault | 34-0 | 34-1 | CB12 |
| Air cooler trip | impossible | 35-1 | CB12 |
| Air cooler low level | impossible | 36-1 | CB12 |
| Fuel pump 1 trip | 37-0 | 37-1 | CB12 |
| Retention tank | 38-0 | 38-1 | CB12 |
| Fuel tank low level | 39-0 | 39-1 | CB12 |
| Water flow | impossible | 40-1 | module 3 |
| Fire detection | impossible | 41-1 | module 3 |
| Oil leak | impossible | 42-1 | module 3 |
| Fuel leak | impossible | 43-1 | module 3 |
| Air cooler compartment door open | impossible | 44-1 | module 3 |
| MCPS door open | impossible | 45-1 | module 3 |
| Main circuit breaker open | 46-0 | 46-1 | module 3 |
| Overload | 47-0 | impossible | CB12 |

| Wording | Alarm | Fault | Generated on |
|--|------------|------------|--------------|
| MTU engine oil pressure | impossible | 48-1 | module 5 |
| MTU engine HV water temperature | impossible | 49-1 | module 5 |
| MTU engine overspeed | impossible | 50-1 | module 5 |
| MTU engine general fault | impossible | 51-1 | module 5 |
| MTU engine general alarm | 52-0 | impossible | module 5 |
| QST30 engine overspeed | impossible | 53-1 | module 5 |
| QST30 engine general fault | impossible | 54-1 | module 5 |
| QST30 engine general alarm | 55-0 | impossible | module 5 |
| Engine oil high level | 56-0 | impossible | module 4 |
| Engine oil high level | impossible | 57-1 | module 4 |
| Startup battery min. voltage | 58-0 | impossible | module 4 |
| Startup battery charger | 59-0 | impossible | module 4 |
| MX coil | impossible | 60-1 | module 4 |
| Damping valve | impossible | 61-1 | module 4 |
| Starter air pressure | 62-0 | impossible | module 4 |
| Magneto-thermal relay | 63-0 | impossible | module 4 |
| Engine oil pressure | 64-0 | impossible | module 4 |
| Engine water temperature | 65-0 | impossible | module 4 |
| Engine oil temperature | 66-0 | impossible | module 4 |
| Fuel low level (combined in option No. 16) | 67-0 | impossible | module 4 |
| Fuel high level | 68-0 | impossible | module 4 |
| Fuel very low level | impossible | 69-1 | module 4 |
| Fuel very high level | impossible | 70-1 | module 4 |
| Oil low level | 71-0 | impossible | module 4 |
| Cylinder head temperature | impossible | 72-1 | module 4 |
| Thermostat water inlet temperature | impossible | 73-1 | module 4 |
| No water circulation | impossible | 74-1 | module 4 |
| Bearing temperature | 75-0 | impossible | module 4 |
| Bearing temperature | impossible | 76-1 | module 4 |
| Stator temperature | 77-0 | impossible | module 4 |
| Stator temperature | impossible | 78-1 | module 4 |
| Fuel pump 2 trip | 79-0 | 79-1 | module 4 |

(*) Special case: the "engine oil high level" indication is possible as an alarm and as a fault with two different numbers (56-0 and 57-1).

8 - Access to programming and language change functions

The programming/browsing functions are always accessed using the **M** button. However, the various menus and parameters are always displayed in English only (when international language is selected).

| | |
|-----------------------|------------|
| GENERAL (vers. 1.05E) | |
| V : Valida | Esc : Exit |
| Control | o Config |
| Alarm/Flt | o Status |
| o Inputs | o Outputs |
| o Contrast | o Protect |
| o GES | |

The software version number appears on the first line next to **GENERAL**. All the texts are in English.

By pressing the **M** button for at least three seconds, the first screen is displayed to allow you to change the language, and possibly the time and date.