EMRP3™

ENGINE MONITORING REMOTE PANEL

(EMRP3.2, EMRP3.3)

INSTALLATION AND OPERATION MANUAL

December 2011

MNA-EMRP3-04

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1. Introduction

The EMRP3 display panel allows the user to remotely monitor the data (electrical, mechanical and events tables) measured by an EMCP3 generator controller and its optional modules. It also allows him to easily access data and perform a remote control of your generator with a 5.7" high visibility TFT 65 536 colors touch screen. The built-in "Web Gate" function allows independent access to the EMRP3 with a simple Internet browser no matter where the user is located in the world. The EMRP3 module also has a Modbus slave communication port allowing the user to access the Modbus register grouped into contiguous register.

CONTROLS

- Auto/Start/Stop;
- Time/date modification and synchronization with the EMCP3 controller;
- 12 warning/faults/customizable events.

DIGITAL INDICATION

- **Languages Available :**
  English French

- **Units Indications Available :**

Temperature :	Celsius	Fahrenheit	
Pressure :	kPA	PSI	
Volume :	Liter	US Gallon	UK Gallon

- **Generator Data:**

AC voltage (VAC)	Power factor	Real power (kW)
Current (A)	kW hour exported	Apparent power (kVA)
Frequency (Hz)	kVar hour exported	Reactive power (kVAr)

- **Engine Data :**

Engine revolution	Oil temperature	Genset operating mode
Hours of operation	Oil pressure	Service maintenance interval
Fuel temperature	Coolant temperature	Crank attempt counter
Exhaust temperature	Battery voltage	Successful start counter

- **Available Only With EMRP3.3 Version :**

Fuel level	Exhaust temperature	Turbo pressure
Fuel pressure	Intake manifold air temperature	Atmospheric pressure
Instantaneous fuel consumption	Cylinder temperature	Generator winding temperature
Total fuel consumption	Battery voltage	Generator bearing temperature

WARNING/SHUTDOWNS INDICATION

Overcrank	Overspeed	High fuel pressure
Low coolant temperature	High battery voltage	Fuel filter restriction
High coolant temperature	Low battery voltage	High intake manifold air temperature

EVENTS TABLES

- Display the 20 latest events, warnings or faults for the following gensets equipments :

EMCP3 controller	2 X Thermocouples module	Automatic voltage regulator (CDVR)
Engine control module (ECM)	2 X Inputs/outputs module	RTD module

INPUTS/OUTPUTS OF THE EMCP3

[1] When an internet connection is available.

* All of the above data are displayed when available in the EMCP3 controller, depending on the model of the generator installed options and optional modules installed on the generator (refer to the generator manufacturer for details)

* EMRP3.X855TT and EMRP3.X855TR models require a converter (Ethernet – RS-485) to communicate with the EMCP3 and an Ethernet switch for using the "Web Gate" function.

2. Installation

The installation of the EMRP3 requires an Ethernet to RS-485 converter. The converter needs to have a data transfer rate of 38400 bps. In order to use the "Web Gate" function, the user should install a 3 ports switch. Moreover, a stable supply of 24VDC needs to be available.

2.1 Basic Connection Block Diagram

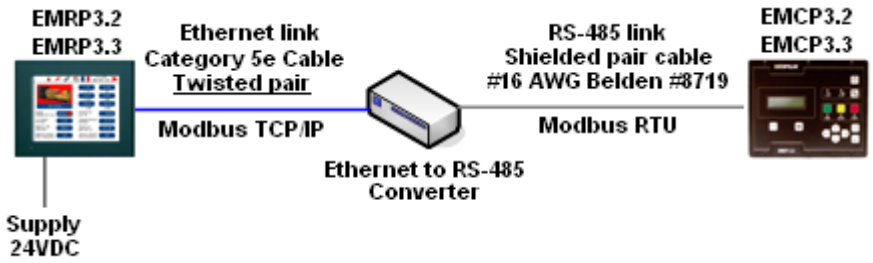


Figure 1: Basic installation

If the EMRP3 is directly supplied by the batteries of the generator set, add a voltage regulator 24VDC/24VDC and that can regulate the exit voltage at 24VDC when the generator starts. The addition of the voltage regulator will avoid the restart of the EMRP3 when the generator starts.

The Ethernet link must be made with a Category 5e twisted pair cable.

2.2 Complete installation with the "Web Gate" function connection

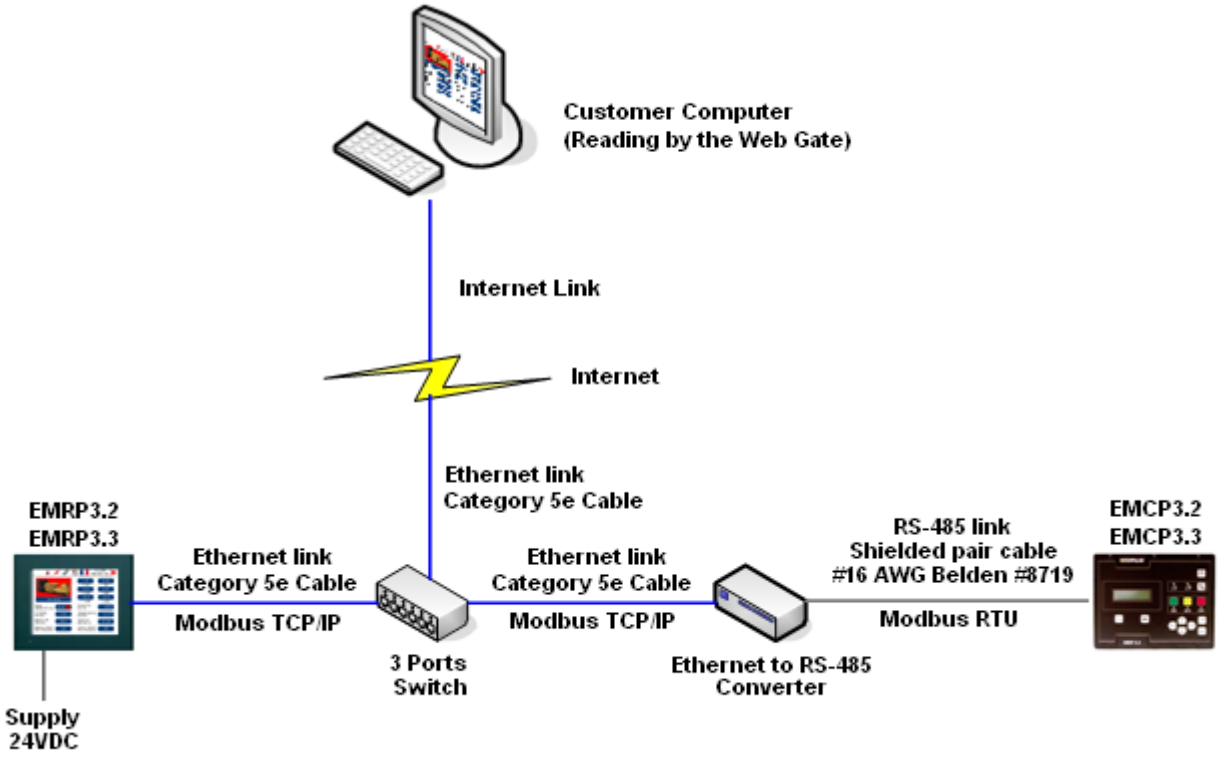
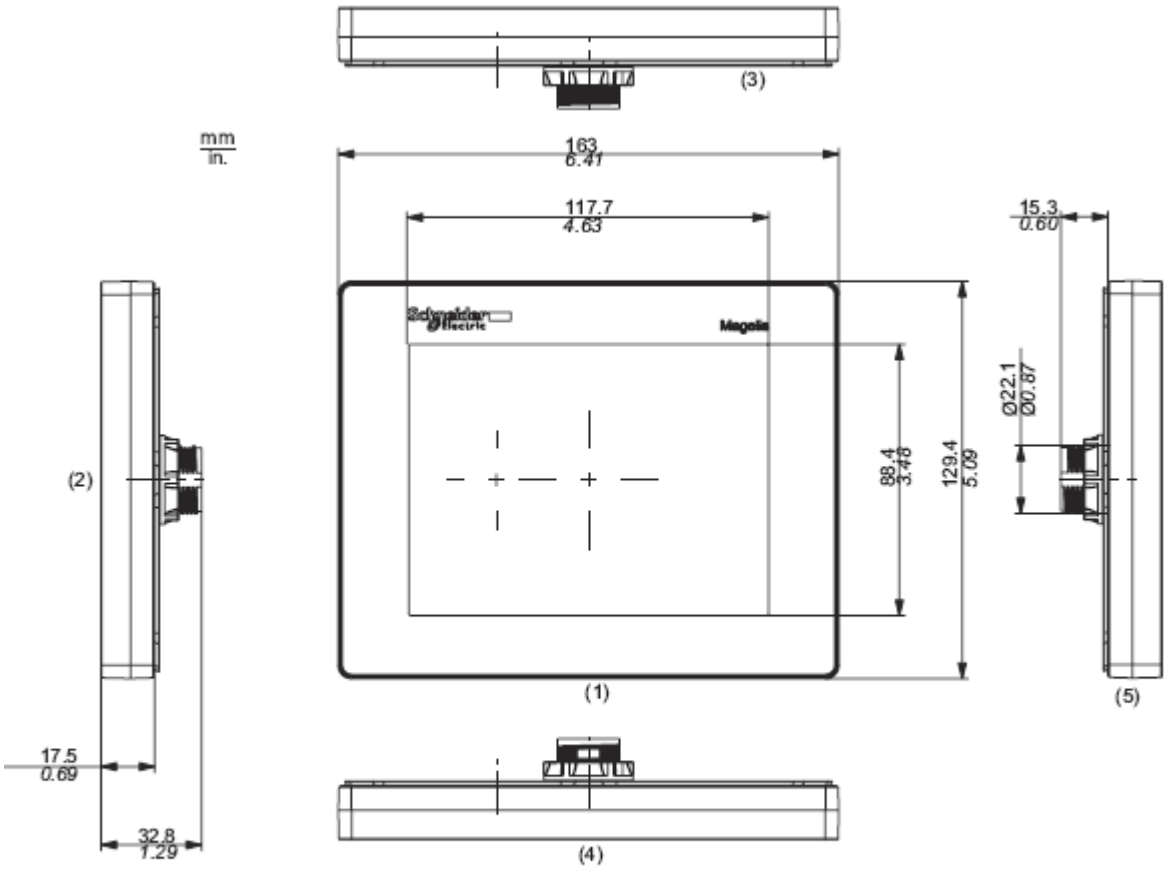


Figure 2: Complete Installation

If the EMRP3 is directly supplied by the batteries of the generator set, add a voltage regulator 24VDC/24VDC and that can regulate the exit voltage at 24VDC when the generator starts. The addition of the voltage regulator will avoid the restart of the EMRP3 when the generator starts.

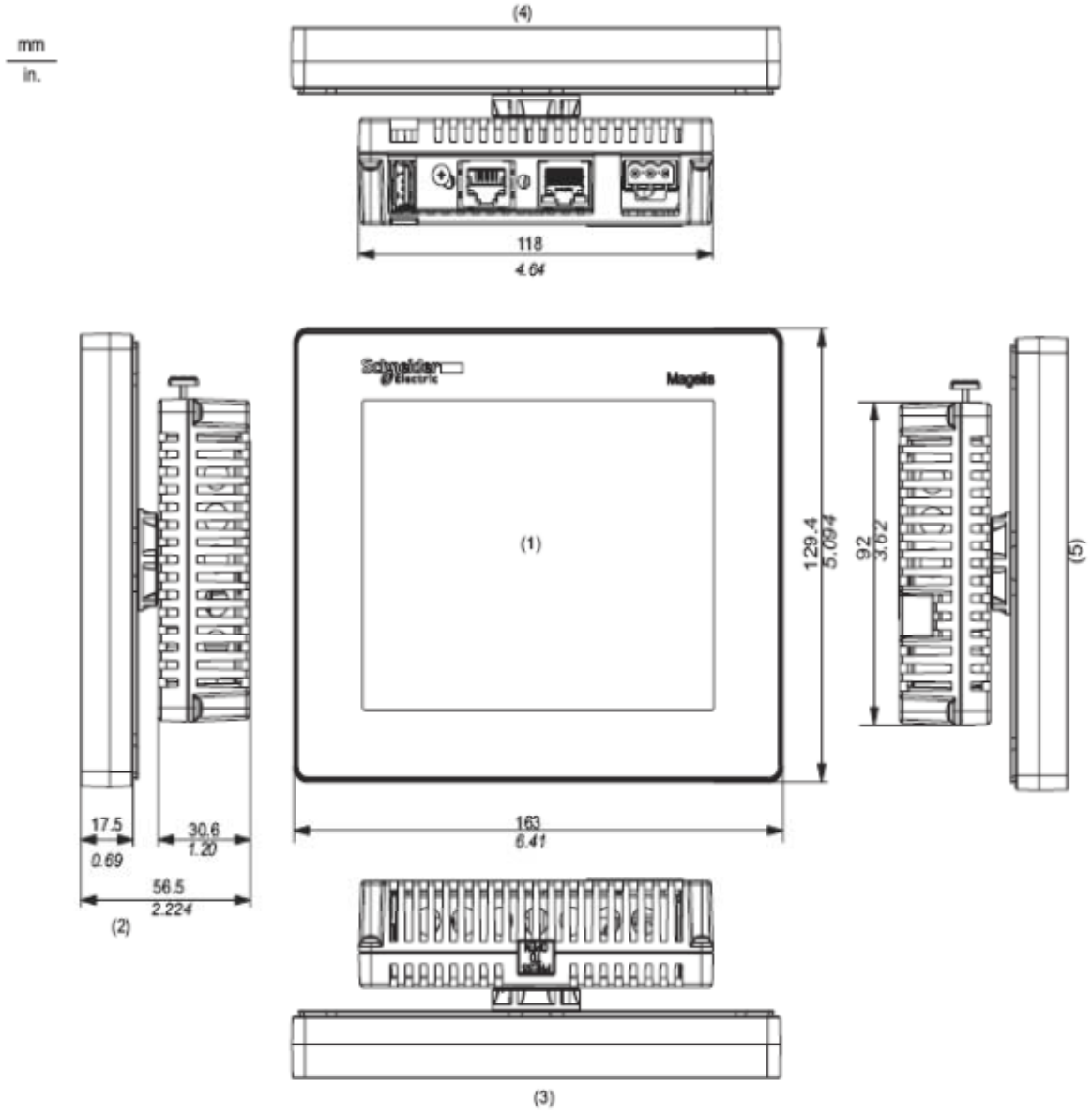
The Ethernet links must be made with standard Category 5e cables.

2.3 Installation on a cabinet using screw fasteners



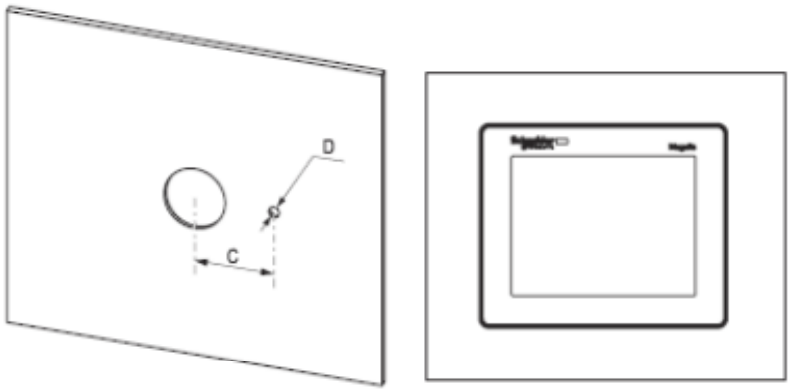
(1) Front
(2) Right Side
(3) Bottom
(4) Top
(5) Left Side

Figure 3: Dimensions of the touchscreen



(1) Front
(2) Right side
(3) Top
(4) Bottom
(5) Left side

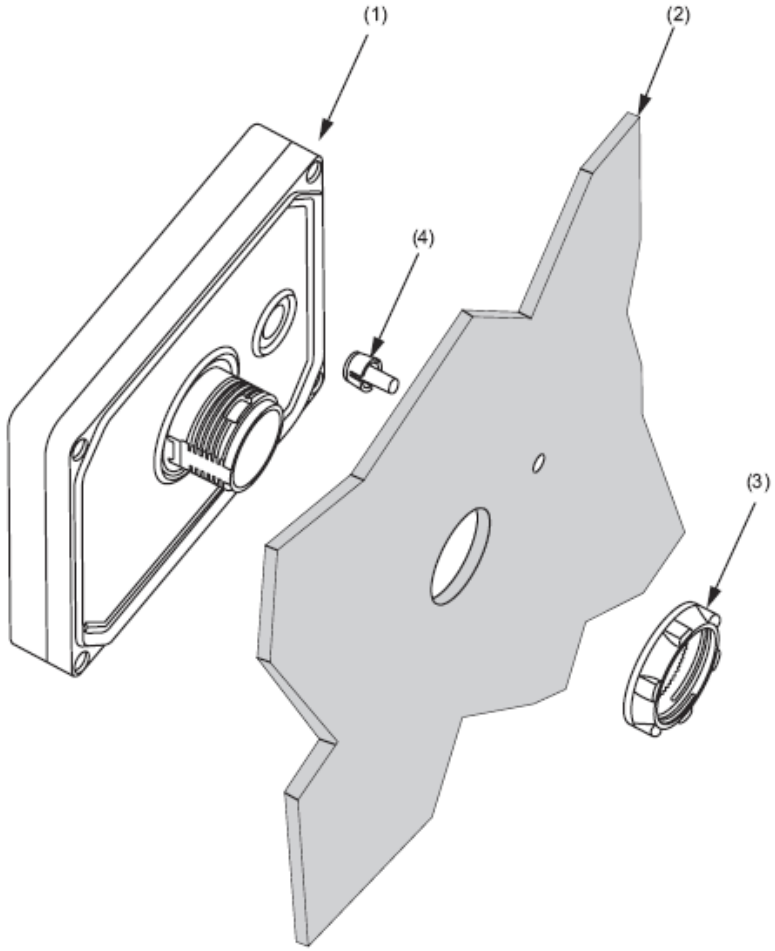
Figure 4 : Dimensions of the entire touchscreen



Dimensions

Unit	C (mm)	C (in.)	D (mm)	D (in.)
HMI STU 655/855	+0 30.00 -0.20	+0 1.18 -0.007	+0 4.00 -0.20	+0 0.15 -0.007

Figure 5 : Drilling for fixing the touchscreen



(1) Display module
(2) Support
(3) Nut
(4) Tee

Figure 6 : Installation of the touchscreen

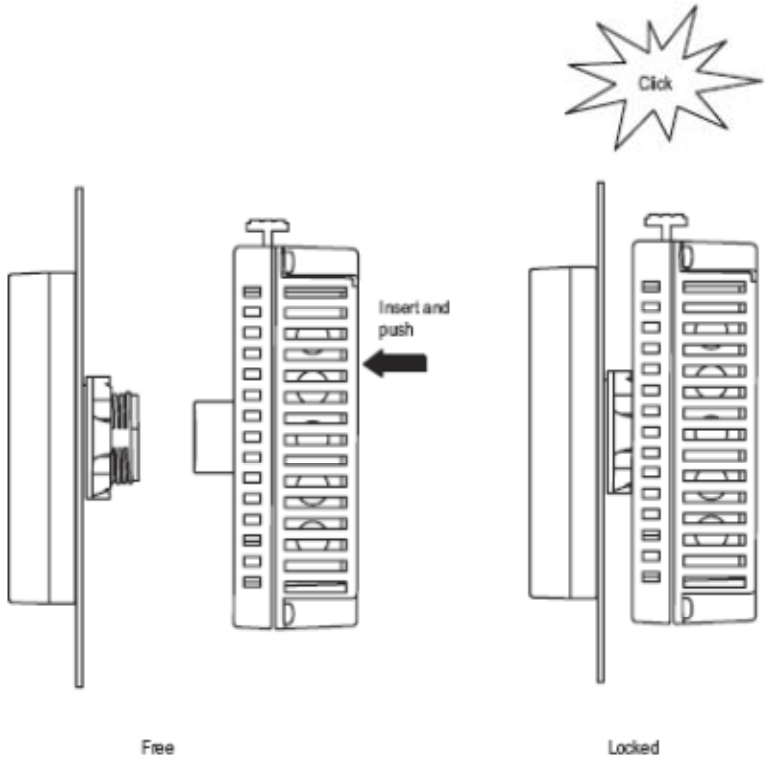


Figure 7 : Inserting the module behind the touchscreen

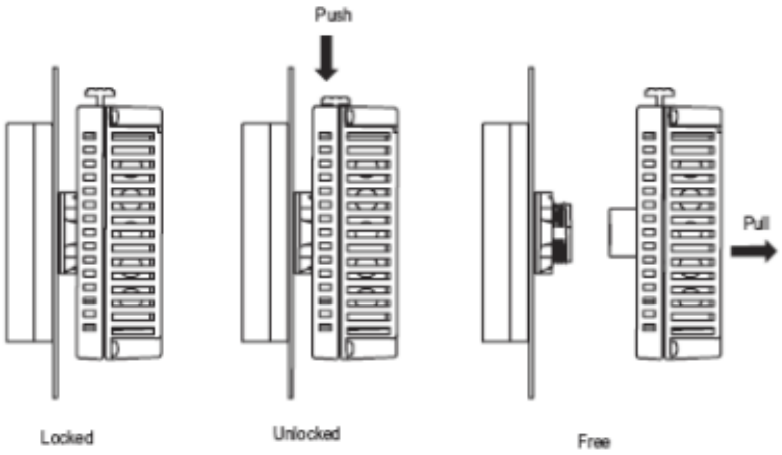


Figure 8 : Remove the rear module of the touchscreen

2.4 Connecting the Power Cord

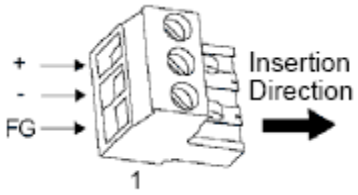


Figure 9: Power connector

Connection	Wire
+	24 V
-	0 V
FG	Grounded terminal connected to the unit chassis.

The following table describes the different steps in order to connect the power connector:

Step	Action
1	Remove the power cord from the power supply.
2	Remove the power plug from unit.
3	Remove 7 mm (.28 in.) of the vinyl cover of each of the power cord's wires.
4	If using stranded wire, twist the ends. Tinning the ends with solder reduces risk of fraying and ensures good electrical transfer.
5	Connect the wires to the power plug by using flat-blade screwdriver (Size 0.6 X 3.5)
6	Torque the mounting screws: 0.5 to 0.6 nm (5 to 7 lb-in)
7	Replace the power plug to the power connector.

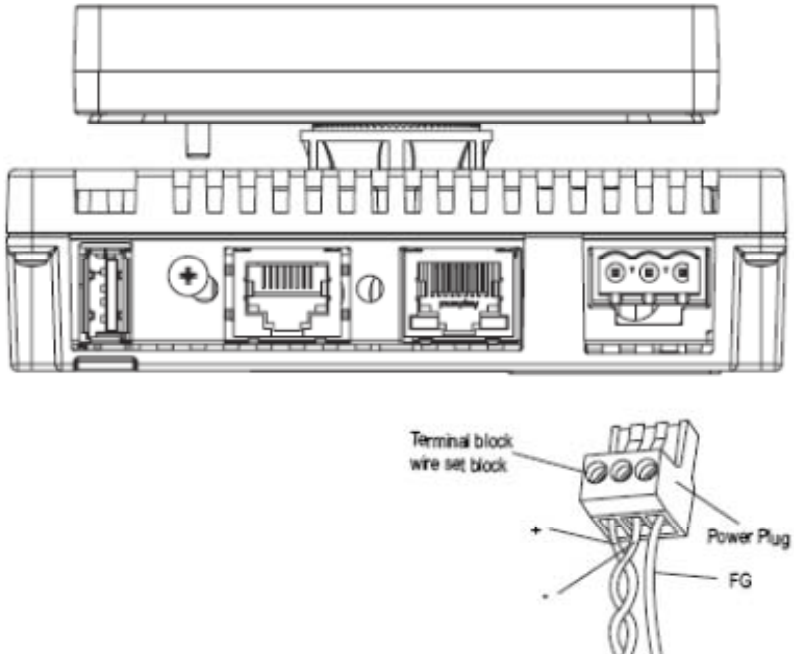


Figure 10 : Connecting the power cable to the touchscreen

2.5 Cable Connector RJ45

The following illustrations show the location of the cable connectors RJ45:

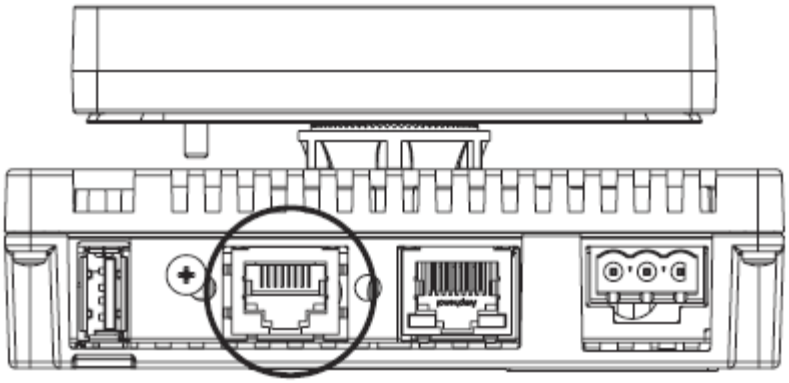


Figure 11 : Connector Ethernet RJ45

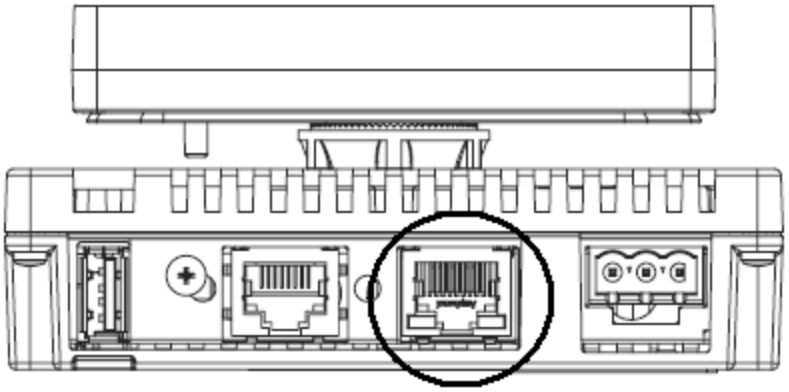


Figure 12 : Connector RJ45 for communication RS485

2.6 Setting the Communication Port of the EMCP3

The EMCP3 communication port has to be configured with the same parameters as the Ethernet to RS-485 converter. In order for the EMRP3 to work to its full capacity it is preferable to adjust the communication parameters of the link RS-485 (Modbus RTU) at a speed of 38400 baud.

In order to configure the EMCP3 from the main menu, the user has to go to the following section:
-Configure ↵ -Setpoints ↵ -Network ↵ -DataLink – SCADA ↵

Subsequently, the user must adjust the communication parameters below. The settings below enable optimum use of EMRP3. Parameters Baud Rate and Parity must be configured with the same values than the converter Ethernet to RS-485.

Baud Rate: 38400 bauds
Parity: None
Slave Address: 1
Connect Timeout Interval: 30.0 sec
RS-485 Bias Resistor: Disable

2.7 Configuring the Ethernet to RS-485 converter

Converter Ethernet RS-485 must be configured as follows:
Baud Rate: 38400 baud
Parity: None
Address IP: 192.168.0.104

The parameters of the IP address may differ in the integration of EMRP3 in a network. It must, however, change the settings in the EMRP3 under Section 2.8 if the modules are integrated into an existing network.

2.8 Setting the communication port of the EMRP3

WARNING!
The communication port of the EMRP3 is already configured at the factory for optimum use. It should not be changed unless the module integration in a network.

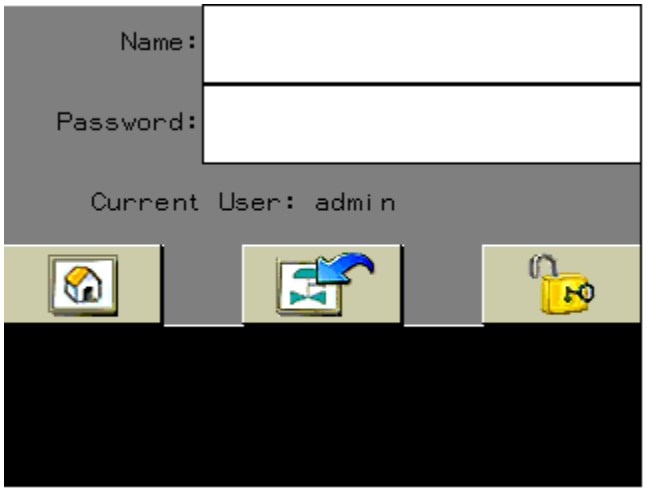
To configure the communication port EMRP3, press on **Screen settings** 

in the main menu.

The EMRP3 asks for a password to the user. Enter the username and password as follows:
Name : admin
Password : emrp

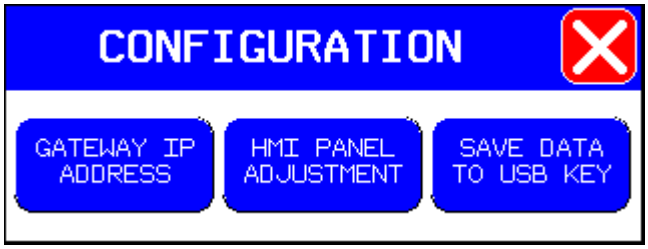
When completed, press the icon  to validate your password. Then click the icon:

	To exit the password menu and return to the main menu.
	To exit the password menu and return to the previous page.

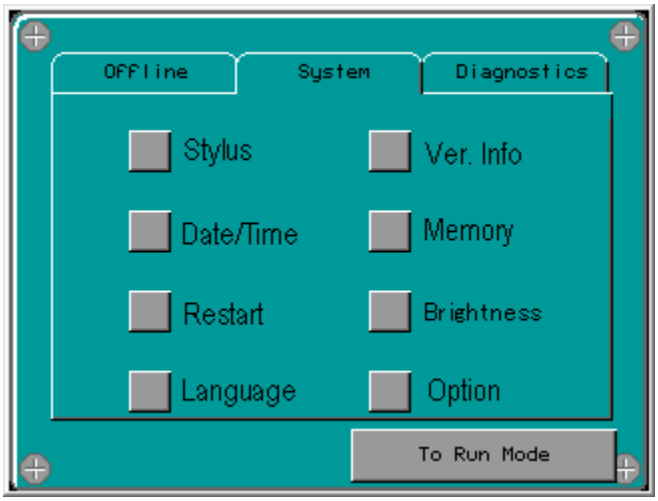


When the password is validated, return to the **Screen settings** 

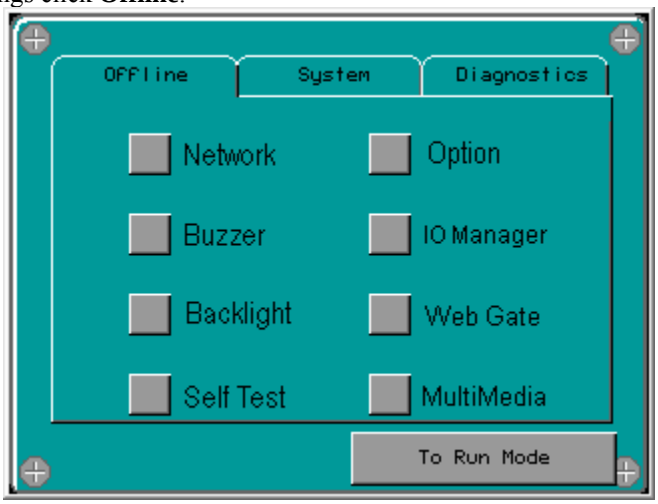
of the main menu screen and the next page will appear.



Press the icon **HMI panel adjustment** and the next page will appear.

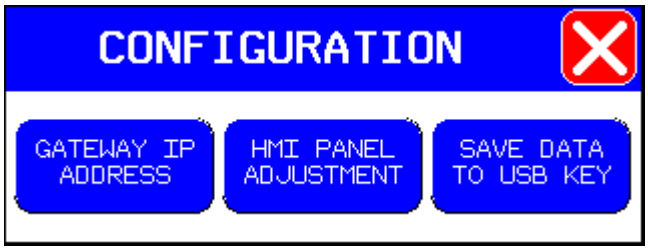


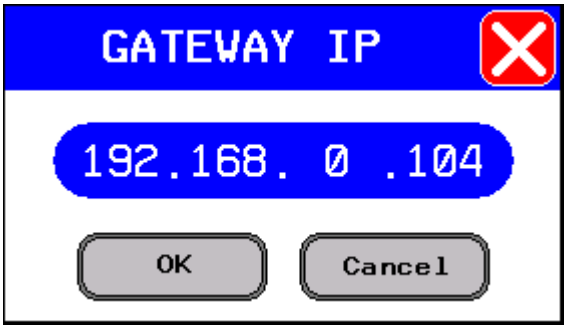
To edit the communications settings click **Offline**.



The **Network** page allows you to set the network configuration of the EMRP3. The default settings are:
Adresse IP : 192.168.0.100
Subnet Mask : 255.255.255.0
Gateway : 192.168.0.1
The user can modify the settings above to integrate the module EMRP3 to its network.

The configuration of the communication with the Ethernet to RS-485 converter can be changed in section **Gateway IP address**.





By default the devices are configured using the IP address: 192.168.0.104.

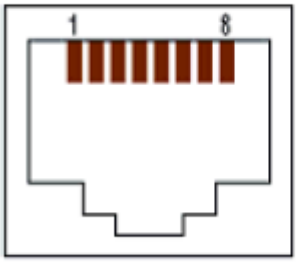
2.9 Configure the "Web Gate" function

The configuration of the "Web Gate" function is done directly when setting the IP address of EMRP3. The default IP address of the "Web Gate" function is: 192.168.0.100. **Caution: When using the "Web Gate" function, the communication port 6000 of your network must be unlocked to allow the user to access the contained of EMRP3. For more details, check with your network administrator**.

2.10 RS485 (COM1) port connection

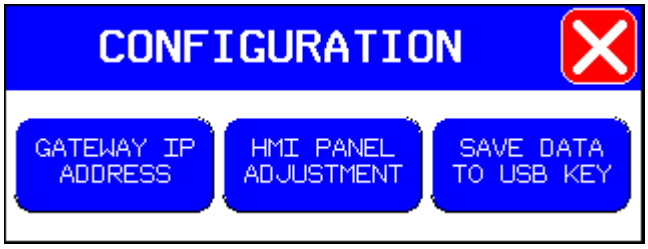
The RS485 (COM1) is available for modbus data reading on the **EMRP3.2855TR and EMRP3.3855TR modbus RTU slave version only.**

The diagram below shows connection to be made to connect the RS485 port.

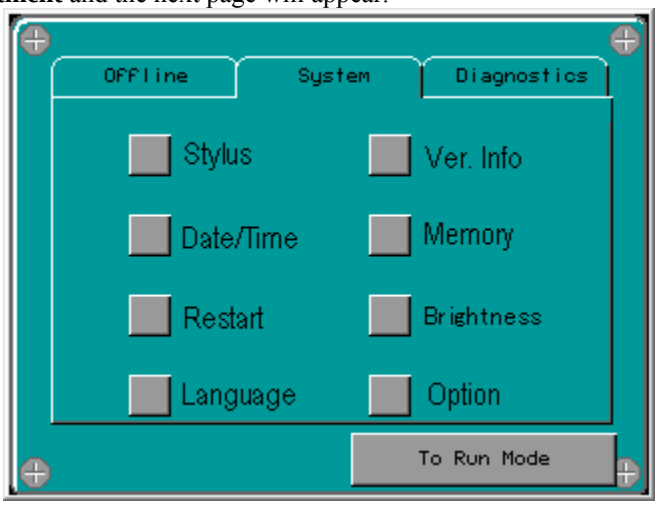
Pin Connection	Pin	Signal Name	Direction	Meaning
Front 	1	Not connected	-	-
	2	Not connected	-	-
	3	Not connected	-	-
	4	D1	Output/Input	Transfer Data (RS485)
	5	D0	Output/Input	Transfer Data (RS485)
	6	RTS	Output	Request To Send
	7	Not connected	-	-
	8	SG	-	Signal Ground

The RS485 port configuration is as follows :
Baud Rate : 38400 baud
Parity : None
Slave Adress : 1

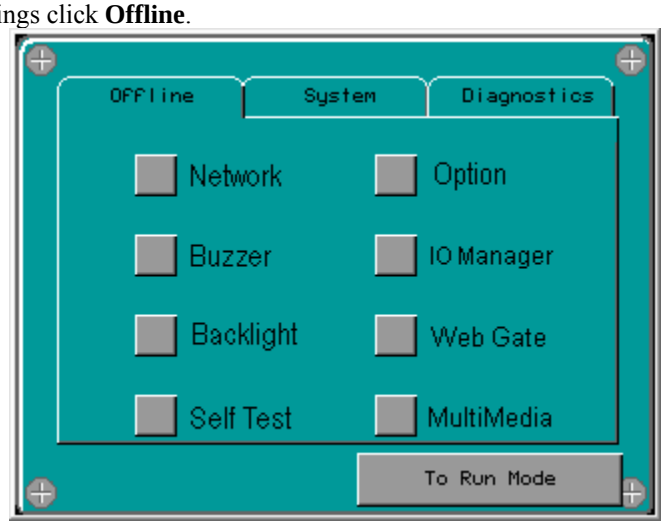
To change the configuration of the RS485 port press the icon **Screen settings**  in the main menu screen and the next page will appear.



Press the icon **HMI panel adjustment** and the next page will appear.



To edit the communications settings click **Offline**.



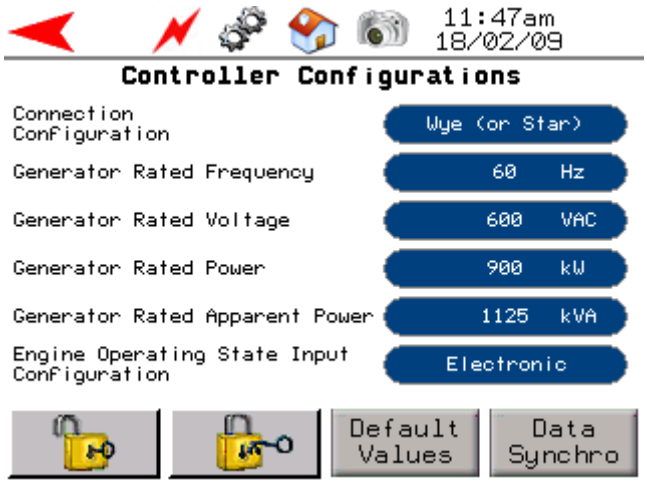
Subsequently, press **IO Manager**.
A new page will appear, press **Equipment Config**.
Select from the drop down menu **ModbusSlave** equipment and make changes to the communications port 485 depending on your setup.

3. Configuration of the Controller

From the main menu, press **Generator Status** 

. When the Generator Status page appears, press the right arrow  to access the configuration controller.

The controller configuration page will display the data configured in the EMCP3. The configuration of the controller must be kept updated when a technician makes some adjustments in the EMCP3. To maintain the configuration updated, click **Data Synchro** to synchronize the configuration of the EMCP3 in the EMRP3. The configuration of the controller is used by the EMRP3 to adjust the analog gauges.



	Provides access to configuration functions and control of the screen. Enter the username and password as follows: **Name : admin** **Password : emrp**	Default Values	Enables the user to reset the Default Values (factory) of the EMRP 3 (text of the custom events).
	Enables the user to secure the screen and limit access to functions and configuration control of the screen.	Data Synchro	Synchronizes the configuration of the EMCP3 towards the EMRP3.

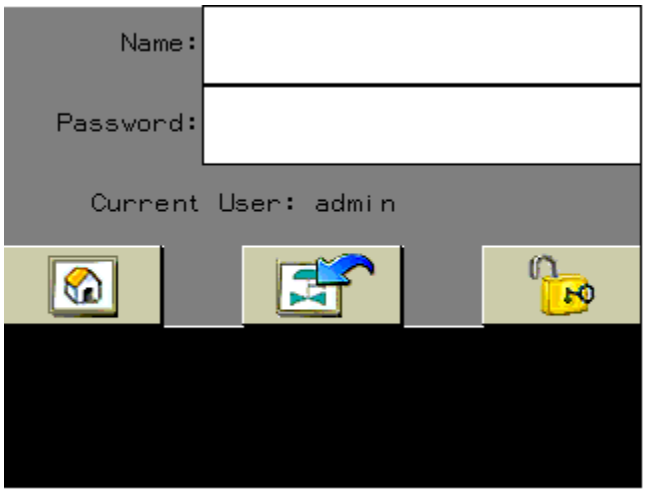
4. Setting the date and time

It is possible for the user to set the date and time of the EMRP3 by pressing the date and / or time in the upper right portion of the screen. The system then asks the user a password.

Enter the username and password as follows:
Name: admin
Password: emrp

When completed, press the icon  to validate your password. Then click the icon:

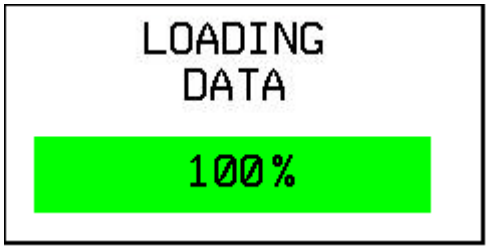
	To exit the password menu and return to the main menu.
	To exit the password menu and return to the previous page.



By pressing back on the date and / or time, the system can set the date and time. Enter the desired values and press OK when finished. The date and time are updated in the EMRP3 and **it also transfers the date and time in the EMCP3**.

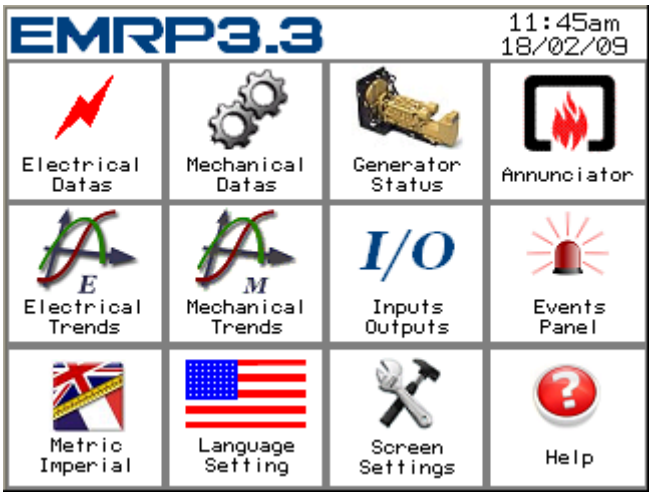
5. Page overview

5.1 Data synchronization and communication losses

	When starting EMRP3, it must synchronize the data to adjust the generator with the controller EMCP3. The synchronization may take 10-20 seconds.
	When a communication failure is detected, the EMRP3 displays a cable unplugged. The user must therefore ensure that the communication parameters are adjusted in the EMRP3, the Ethernet to RS-485 converter, the controller EMCP3 and the Ethernet cable and RS-485 are well connected.

5.2 Main Menu

The main menu allows the user quick access to different pages.



Electrical Datas	Displays the first page of the electrical data.	Mechanical Datas	Displays the first page of the mechanical data.
Generator Status	Displays the status of the generator. This page provides a quick overview of the state of the generator.	Annunciator	Displays the first page of the annunciator. The annunciator provides a quick overview of the various alarms from the generator.
Electrical Trends	Displays the first page of the electrical trends. Electrical trends permit visualization of the electrical behavior of the generator.	Mechanical Trends	Displays the first page of mechanical trends. Mechanical trends allow visualization of the mechanical behavior of the generator.
Inputs Outputs	Displays the status of the inputs and outputs of the EMCP3 controller.	Events Panel	Displays the panel events.
Metric Imperial	Displays the selection of units (metric or imperial) menu.	Language Setting	Displays the language menu selection.
Screen Settings	Displays the configuration menu of the touch screen.	Help	Displays the first page of help.

5.3 Navigation Bar

The navigation bar allows the user quick access to different pages.

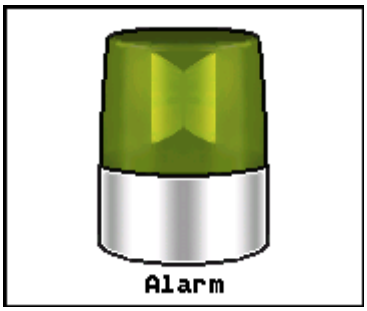
	Navigates to the previous page.		Displays the first page of panels of events.
	Displays the first page of the electrical data.		Displays the first page of the mechanical data.
	Displays the main menu of the EMRP3.		Take a screenshot of the current page.
11:47am 18/02/09	Displays time and date. The user can change the time and date by pressing the latter. When modified, they are automatically synchronized with the EMCP3.		Navigates to the next page.

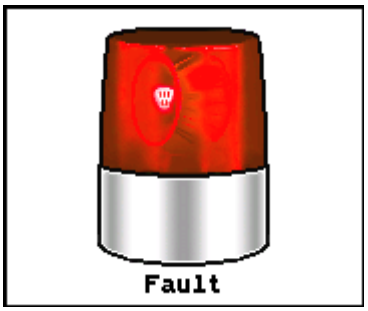
5.4 Status Generator

Page Status Generator can give a quick overview of the state of the generator.

	Displays the status of the generator. The generator is at fault when it is red and at alarm when it is yellow. The text under the icon of the generator allows to know the present state of operation of the generator.		Displays the total single-phase or three phase power generator according to the application.
	Displays the operation mode of the EMCP3 controller. Run, Auto, Stop. It is possible to change the operation mode by pressing the icon. A password will be asked to change the mode of operation of the generator.		Displays the oil pressure of the generator.
	Displays the speed of rotation of the engine in RPM.		Displays the temperature of the engine.
	Displays the total number of hours of function of the generator.		Displays the voltage of the batteries powering the generator.
	Displays the number of hours remaining before the next maintenance.		Displays the number of days remaining until the next maintenance.

5.5 Stroboscope





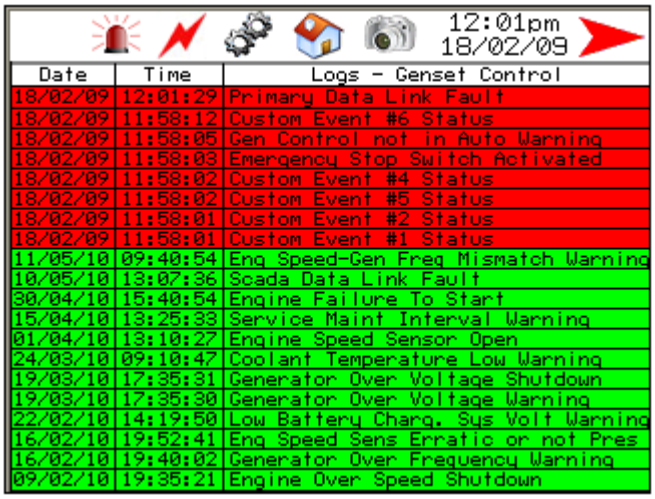
The yellow stroboscope displays an alarm. The red stroboscope displays a fault. The stroboscopes are displayed in the following two conditions:

- When no alarm or fault is present on the EMCP3 and that any new alarm or fault appears on the EMCP3.
- When a new alarm or fault is recognized in the EMRP3 annunciator.

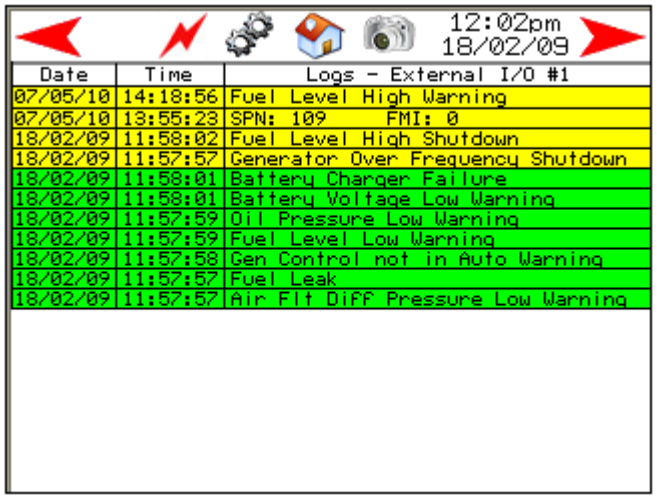
When a new alarm or fault occurs, it is possible that the strobe appears twice consecutively due to the recognition of the alarm or fault in the EMRP3 annunciator.

5.6 Panel of Events

The panel of events pages display the list of events of different modules connected to the generator.

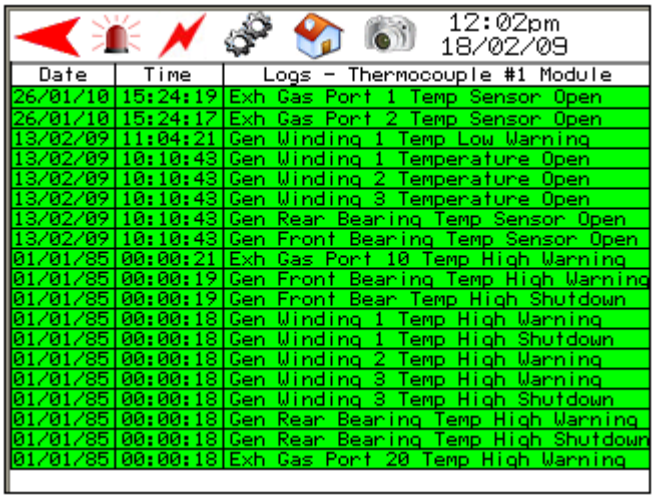


Date	Time	Logs - Genset Control
18/02/09	12:01:29	Primary Data Link Fault
18/02/09	11:58:12	Custom Event #6 Status
18/02/09	11:58:05	Gen Control not in Auto Warning
18/02/09	11:58:03	Emergency Stop Switch Activated
18/02/09	11:58:02	Custom Event #4 Status
18/02/09	11:58:02	Custom Event #5 Status
18/02/09	11:58:01	Custom Event #2 Status
18/02/09	11:58:01	Custom Event #1 Status
11/05/10	09:40:54	Eng Speed-Gen Freq Mismatch Warning
10/05/10	13:07:36	Scada Data Link Fault
30/04/10	15:40:54	Engine Failure To Start
15/04/10	13:25:33	Service Maint Interval Warning
01/04/10	13:10:27	Engine Speed Sensor Open
24/03/10	09:10:47	Coolant Temperature Low Warning
19/03/10	17:35:31	Generator Over Voltage Shutdown
19/03/10	17:35:30	Generator Over Voltage Warning
22/02/10	14:19:50	Low Battery Charg. Sys Volt Warning
16/02/10	19:52:41	Eng Speed Sens Erratic or not Pres
16/02/10	19:40:02	Generator Over Frequency Warning
09/02/10	19:35:21	Engine Over Speed Shutdown



Date	Time	Logs - External I/O #1
07/05/10	14:18:56	Fuel Level High Warning
07/05/10	13:55:23	SPN: 109 FMI: 0
18/02/09	11:58:02	Fuel Level High Shutdown
18/02/09	11:57:57	Generator Over Frequency Shutdown
18/02/09	11:58:01	Battery Charger Failure
18/02/09	11:58:01	Battery Voltage Low Warning
18/02/09	11:57:59	Oil Pressure Low Warning
18/02/09	11:57:59	Fuel Level Low Warning
18/02/09	11:57:58	Gen Control not in Auto Warning
18/02/09	11:57:57	Fuel Leak
18/02/09	11:57:57	Air Flt Diff Pressure Low Warning

Date	Time	Logs - RTD Module
17/11/10	22:41:25	Gen Winding 1 Temperature Open
17/11/10	22:41:25	Gen Winding 2 Temperature Open
10/12/09	10:08:41	Gen Winding 3 Temperature Open
01/01/85	00:00:04	Gen Rear Bearing Temp Sensor Open
01/01/85	00:00:04	Gen Front Bearing Temp Sensor Open



Date	Time	Logs - Thermocouple #1 Module
26/01/10	15:24:19	Exh Gas Port 1 Temp Sensor Open
26/01/10	15:24:17	Exh Gas Port 2 Temp Sensor Open
13/02/09	11:04:21	Gen Winding 1 Temp Low Warning
13/02/09	10:10:43	Gen Winding 1 Temperature Open
13/02/09	10:10:43	Gen Winding 2 Temperature Open
13/02/09	10:10:43	Gen Winding 3 Temperature Open
13/02/09	10:10:43	Gen Rear Bearing Temp Sensor Open
13/02/09	10:10:43	Gen Front Bearing Temp Sensor Open
01/01/85	00:00:21	Exh Gas Port 10 Temp High Warning
01/01/85	00:00:19	Gen Front Bearing Temp High Warning
01/01/85	00:00:19	Gen Front Bear Temp High Shutdown
01/01/85	00:00:18	Gen Winding 1 Temp High Warning
01/01/85	00:00:18	Gen Winding 1 Temp High Shutdown
01/01/85	00:00:18	Gen Winding 2 Temp High Warning
01/01/85	00:00:18	Gen Winding 3 Temp High Warning
01/01/85	00:00:18	Gen Winding 3 Temp High Shutdown
01/01/85	00:00:18	Gen Rear Bearing Temp High Warning
01/01/85	00:00:18	Gen Rear Bearing Temp High Shutdown
01/01/85	00:00:18	Exh Gas Port 20 Temp High Warning

The panel of events pages can display the last 20 events on the various modules of EMCP3.
The pages show the date and time of last occurrence and the message of the event. When an event table is empty the text “Events log empty” appears.

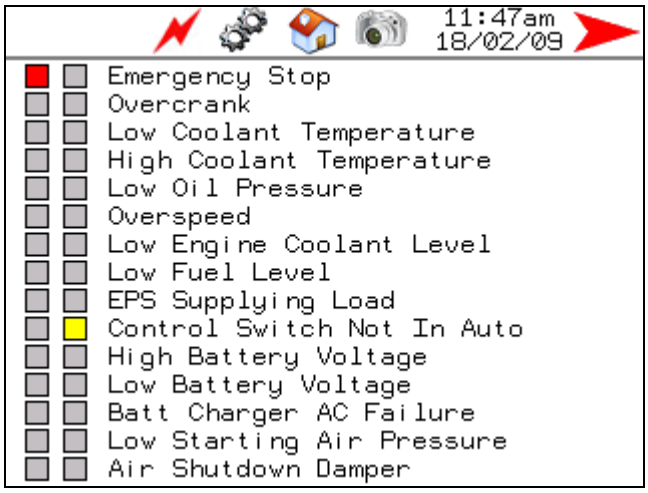
The EMRP3 has the ability to detect which modules are installed on the generator and displays only the panel of events of the available modules. The various panel of events of the available modules are:
Control group (EMCP3), Motor Control (ECM), I / O module 1 and 2 (Module I / O), Digital AVR (CDVR) Module RTD and Thermocouple Module No.1 and No.2.

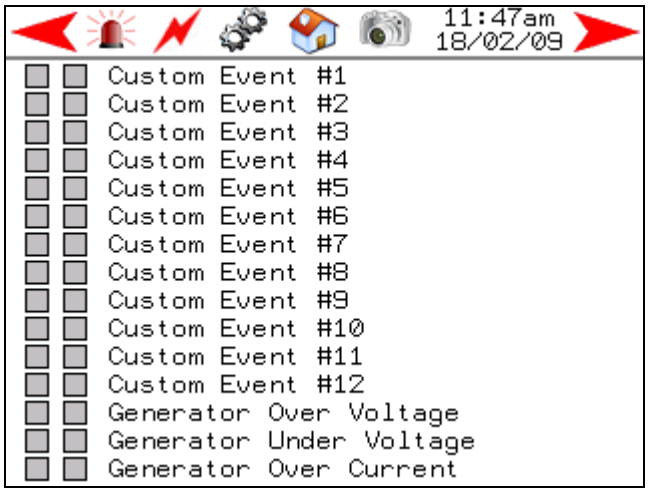
The text of the events is displayed in different colors depending on the state of the event:
The text highlighted in red represents a present event. The condition that caused the event is still present. This must be verified before it can be acknowledge.*
The text highlighted in yellow is an active event. The condition that created the event is no longer there but the event must be acknowledged in order for the system to return to normal operation. To acknowledge the event, the user must acknowledge the event directly on the EMCP3 .*
The text highlighted in green represents an inactive event. The event occurred in the past but no longer affects the system. This text keeps a history of the events .*
* For more information, refer to the manual available at your local Caterpillar dealer:

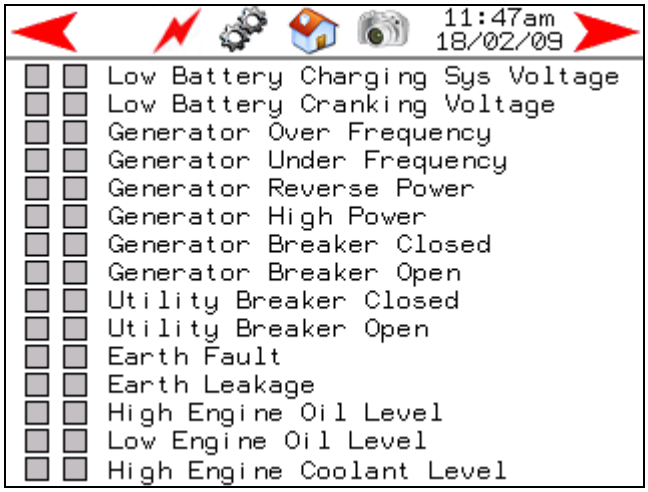
- Caterpillar: Application and Installation Guide EMCP3.1, 3.2, 3.3 Generator set control - LEBE5255

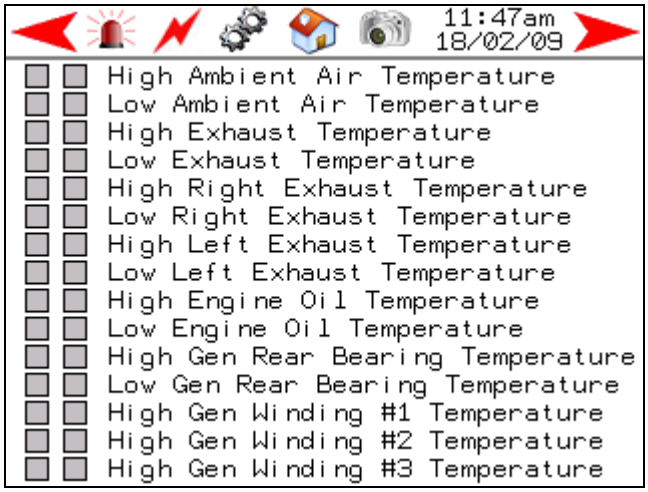
5.7 Annunciator

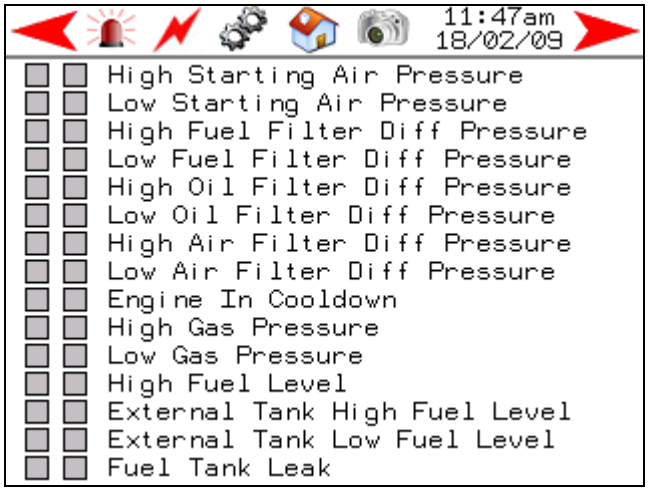
The pages of the annunciator allow a quick overview of the various faults, alarms and status of the generator.

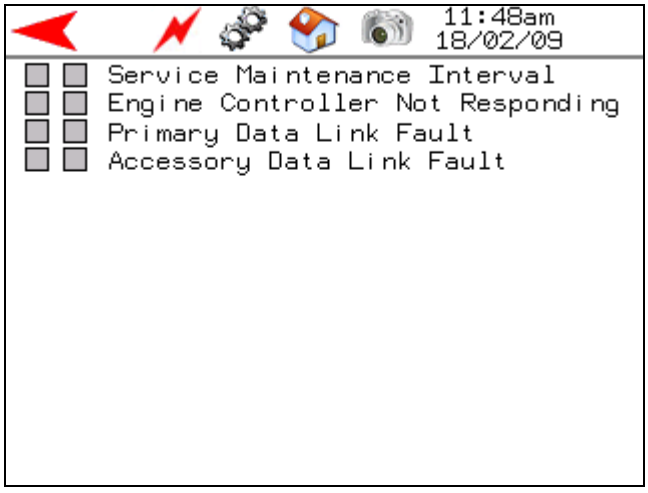












The pages of the annunciator illuminate:

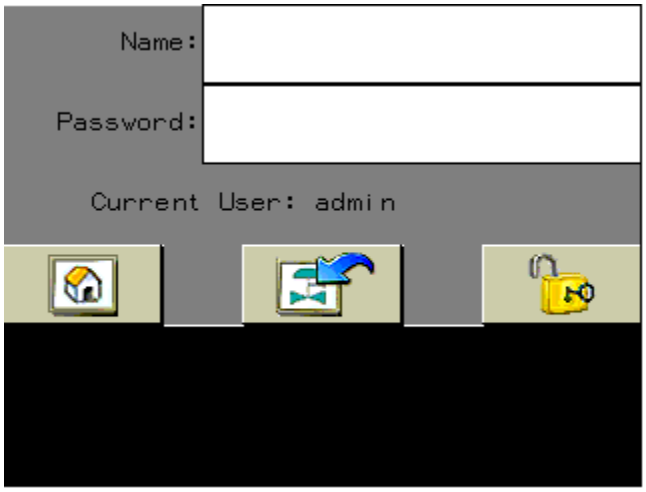
- A red box when a fault occurs.
- A yellow box when an alarm occurs.

To change the text of the customized events, press the text of the custom event in the annunciator. The EMRP3 will ask for a password.

Enter the username and password as follows:
Name : admin
Password : emrp

When completed, press the icon  to validate your password. Subsequently, press the icon:

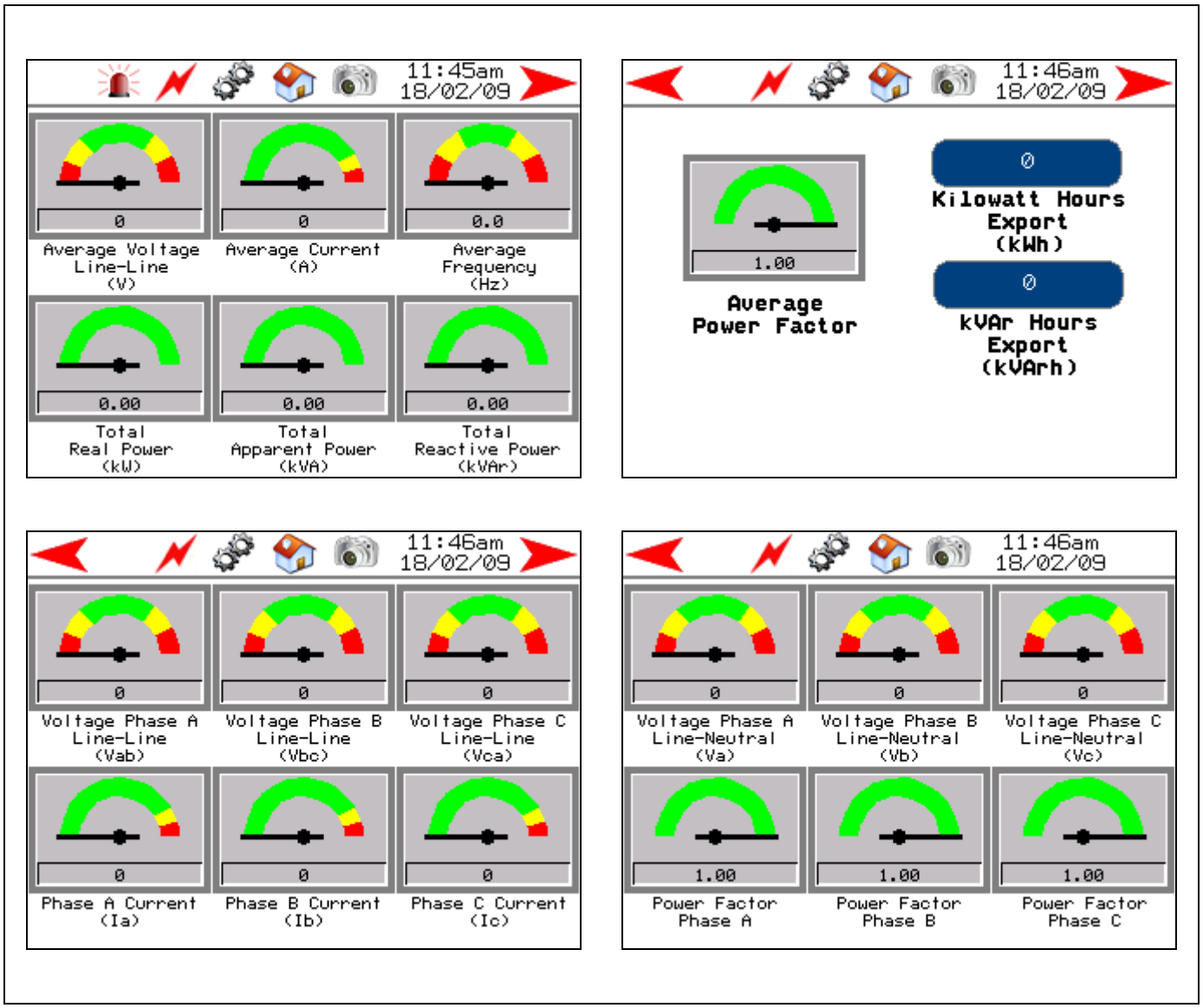
	To exit the password menu and return to the main menu.
	To exit the password menu and return to the previous page.



Press again on the text of the customized event that needs to be edited. The EMRP3 displays a keyboard and allows the user to enter the desired text. Press ENTER when the change is completed. For optimal use of the EMRP3 change the language in the main menu and change the French text of the customized event in the same way. Whenever the text of a customized event is changed, the new text will appear in the panel of events.

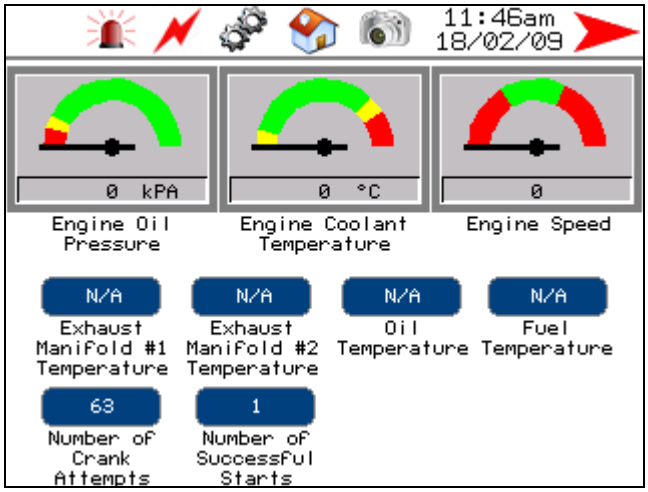
5.8 Electrical Data

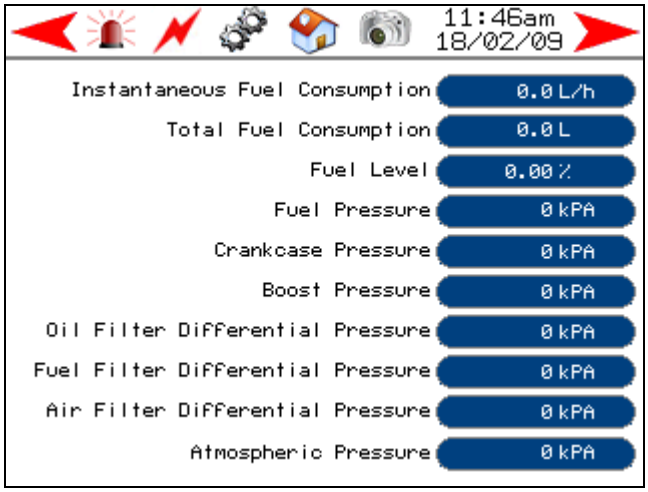
The pages “Electrical Data” display the current state of the generator.

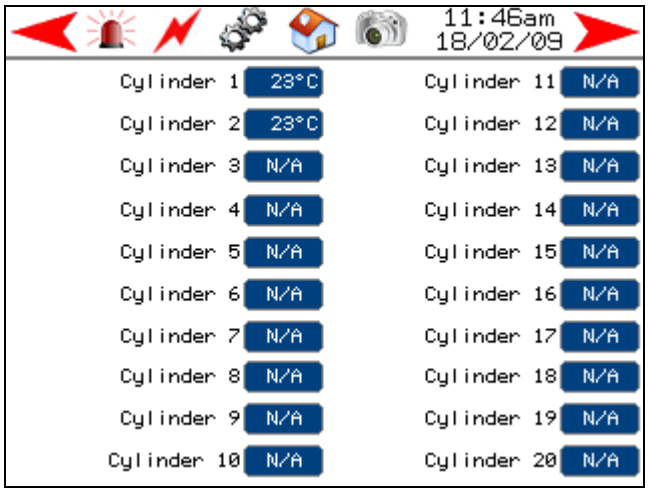


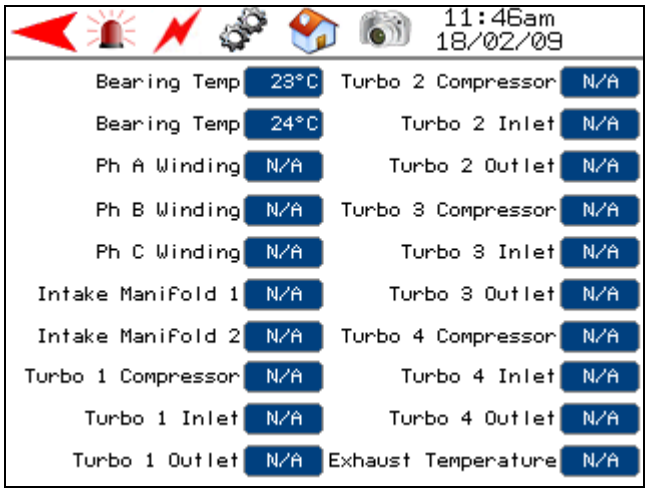
5.9 Mechanical Data

The pages “Mechanical Data” display the current state of the generator.





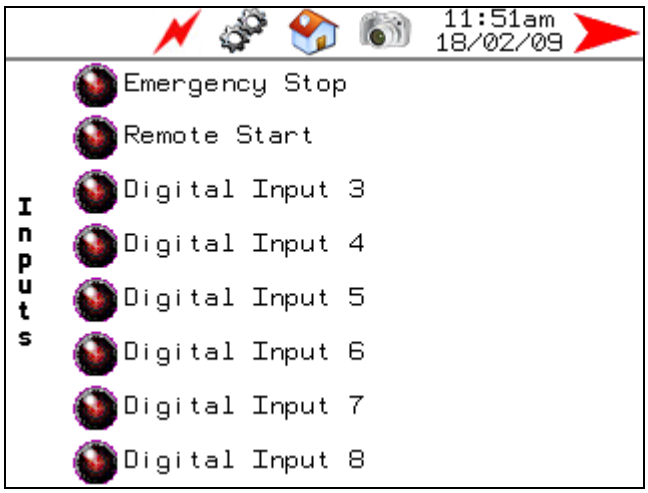


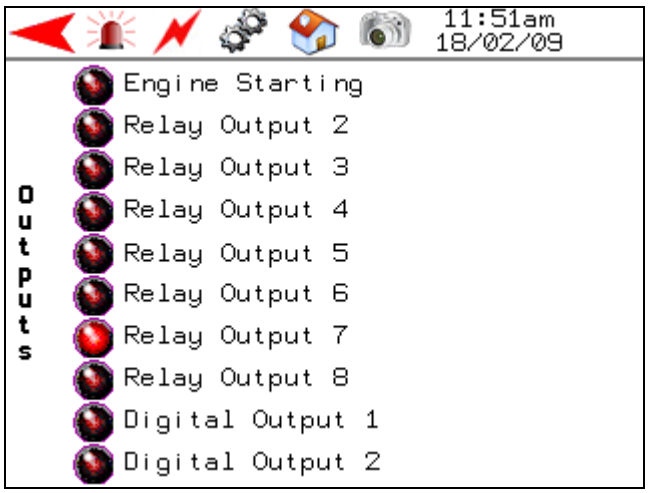


Some mechanical data may not be available depending on the model of controller (either EMCP3.2 or EMCP3.3). Some data such as cylinder temperatures and temperatures of windings, bearings, admissions and turbos require a thermocouple module and / or RTD module. If the above mentioned data are available in the EMCP3 controller, they should be available in the EMRP3.

5.10 Inputs and Outputs

The pages of inputs and outputs display the status of inputs and outputs of the EMCP3 controller.





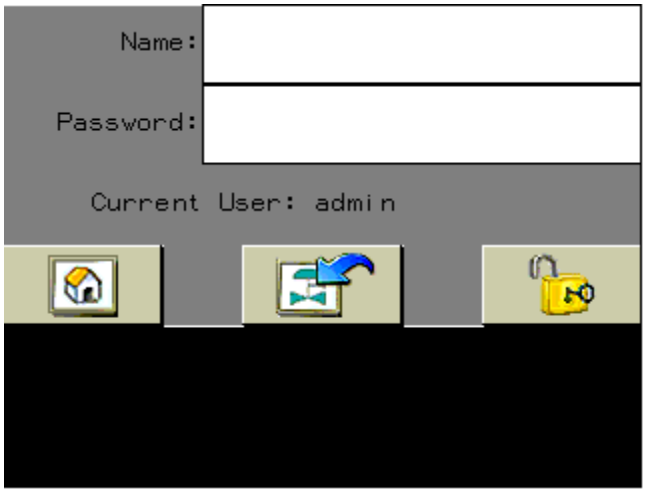
The display of the inputs and outputs allow the user to visualize the current state of each input and output of the EMCP3 controller. In addition, the user can configure the text for each input and output, as well as the color of the lamp which will light to reflect the programming of the EMCP3 controller.

To edit the inputs and outputs, press the text of the input and output to be changed. The EMRP3 will ask for a password.

Enter the following username and password:
Name : admin
Password : emrp

When completed, press the icon  to validate your password. Subsequently, press the icon:

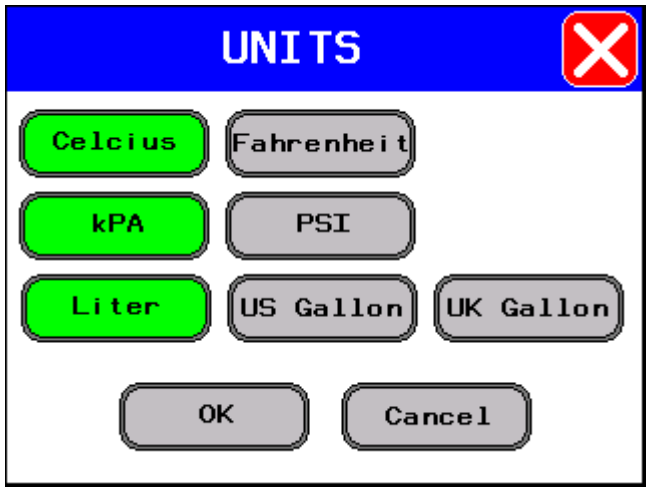
	To exit the password menu and return to the main menu.
	To exit the password menu and return to the previous page.



Press again on the text of the input or output to be changed. The EMRP3 displays a keypad and allows the user to enter the desired text. Press ENTER when the change is completed. For optimal use of EMRP3 change the language in the main menu and change the French text of the input or output in the same way. **The text "Emergency Stop", "Remote Start" and "Engine Starting" are not modifiable.**

To change the color of a lamp, select the lamp to be changed. If the EMRP3 requests a password, follow the authorizing access procedure mentioned previously. When completed, select again the lamp and choose the new color required.

5.11 Metric / Imperial, Choice of Languages



- By pressing the icon "**Metric / Imperial**"  the user can select different display units.
- By pressing the icon "**Language setting**"  the user can select English or French

6. Changing the mode of operation of the generator

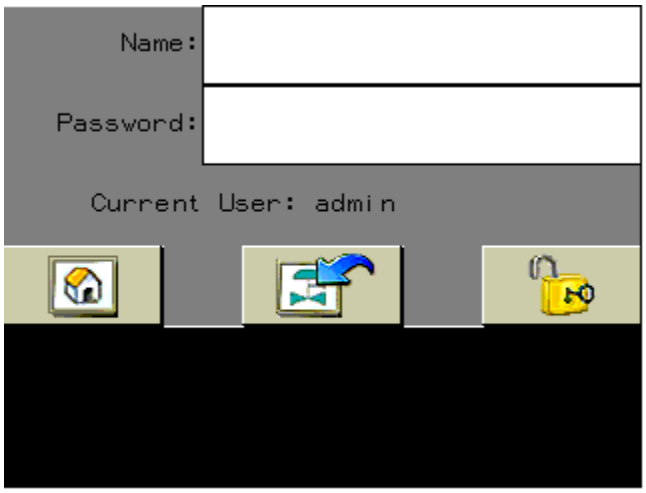
The EMRP3 system allows the user to change the mode of operation of the generator from the EMRP3 or from an internet link via the function "Web Gate" when connected to the network.

To change the mode of operation, the user must be in the page "Generator status". By pressing the blue rectangle on the right-hand side of the text "Generator set mode" a password is required:

Enter the following username and password :
Name : admin
Password : emrp

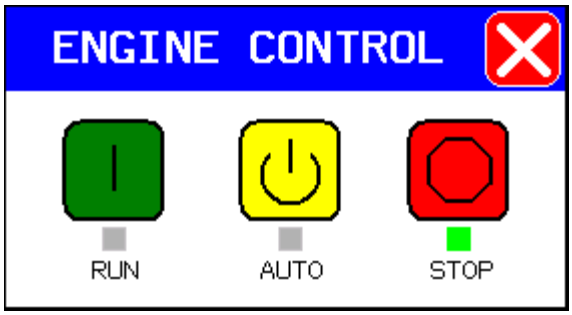
When completed, press the icon  to validate your password. Subsequently, press the icon:

	To exit the password menu and return to the main menu.
	To exit the password menu and return to the previous page.



After entering the password, it will be possible for the user to change the mode of operation by pressing the blue rectangle on the right-hand side of the text "mode generator".

The operator can then change the mode of operation according to the following choices:



Run Mode: Immediate start of the generator.
Auto Mode: Awaiting start request.
Stop Mode: Immediate stop of the generator.

WARNING!

Changing the mode of operation can have serious consequences during a power failure or when a maintenance employee is working near the generator.

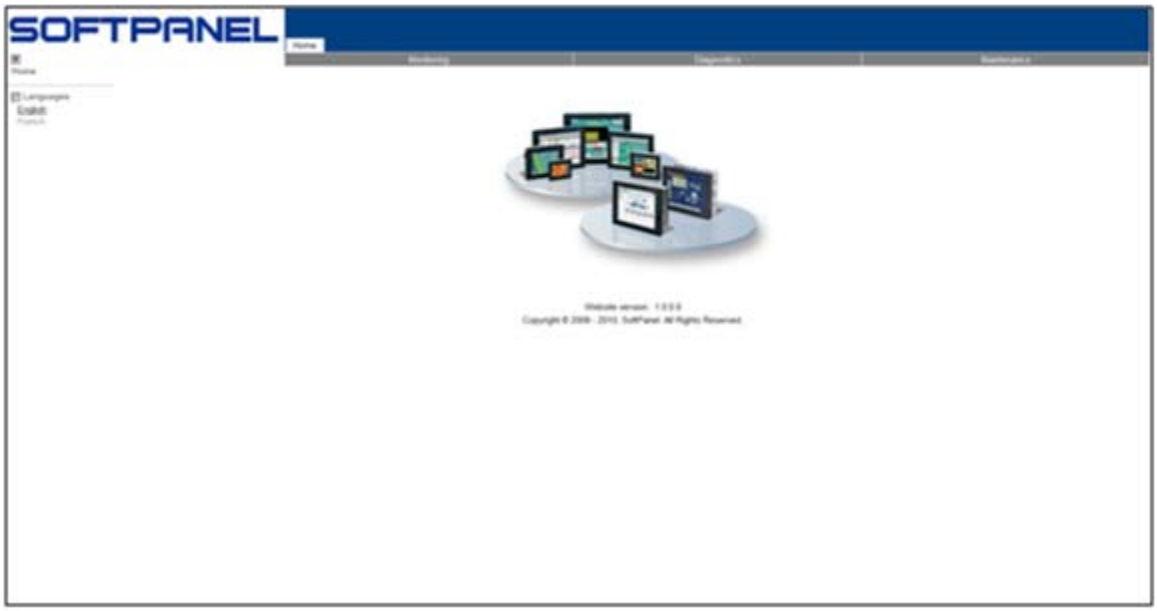
7. Web Gate Function

When connected on an Ethernet link, the EMRP3 system can be viewed remotely, accessing to its IP address. When the user accesses the EMRP3 remotely, the local display is not affected by the remote user. The local user and remote users can view the page they want without affecting other users.

You can access the function "Web Gate" by entering the IP address of the EMRP3 in a web browser such Internet Explorer (the default IP address is 192.168.0.100). At the first start of the function "Web Gate", the web browser will ask the user to install the ActiveX function of the EMRP3. This may take several minutes.

When the EMRP3 is connected to the internet, it is possible to access its content by using its IP address.

The **home** page allows you to select the language (**English**, **French**).



The **monitoring** section lets you view the EMRP3 display **in frame** or **in a new window**.
At first use the operator must, however, first install the "Web Gate" by using the section **Install Web Gate control**.

Diagnostics – Project section allows you to view the software version currently installed in EMRP3 screen.
Diagnostics – Ethernet & TCP / IP section allows you to view the EMRP3 TCP/IP address.

Maintenance - Data - Secondary LOG/ section allows you to saves files of Electrical and Mechanical trends.
Maintenance - Data - Secondary SNAPSHOT/ section allows you to saves screenshot from the camera built into the EMRP3.

The EMRP3 has an ActiveX that can be integrated in various industrial communication systems.

8. Modbus exchange table

For more information about the Modbus tables, refer to the manual available at your local Caterpillar dealer:

- Caterpillar: Application and Installation Guide EMCP3.1, 3.2, 3.3 Generator set control - LEBE5255

Parameter Name	EMCP3 Register Number	EMRP3 Register Number	Length	Scaling	Range	Offset	Num Bits
READ VALUES							
Generator Average Line-Line AC RMS Voltage	100	2100	1	1 V / bit	0 to 64255 V	0 V	16
Generator Average AC RMS Current	101	2101	1	1 A / bit	0 to 64255 A	0 A	16
Generator Average AC RMS Frequency	102	2102	1	1/128 Hz / bit	0 to 501.9922 Hz	0 Hz	16
Generator Overall Power Factor	103	2103	1	1/16384 / bit	-1.0 to 1.0	-1.0	16
Generator Overall Power Factor Lagging	104	2104	1	1 / bit	0 to 3	0	2
Generator Total Percent kW	105	2105	1	0.0078125 % / bit	-251 to 250.99 %	-251 %	16
Generator Total Real Power	106	2106	2	1 W / bit	-2000000000 to +2211081215 W	-2000000000 W	32
Generator Phase A Line-Line AC RMS Voltage	108	2108	1	1 V / bit	0 to 64255 V	0 V	16
Generator Phase B Line-Line AC RMS Voltage	109	2109	1	1 V / bit	0 to 64255 V	0 V	16
Generator Phase C Line-Line AC RMS Voltage	110	2110	1	1 V / bit	0 to 64255 V	0 V	16
Generator Phase A AC RMS Current	111	2111	1	1 A / bit	0 to 64255 A	0 A	16

Generator Phase B AC RMS Current	112	2112	1	1 A / bit	0 to 64255 A	0 A	16
Generator Phase C AC RMS Current	113	2113	1	1 A / bit	0 to 64255 A	0 A	16
Generator Phase A Line-Neutral AC RMS Voltage	114	2114	1	1 V / bit	0 to 64255 V	0 V	16
Generator Phase B Line-Neutral AC RMS Voltage	115	2115	1	1 V / bit	0 to 64255 V	0 V	16
Generator Phase C Line-Neutral AC RMS Voltage	116	2116	1	1 V / bit	0 to 64255 V	0 V	16
Generator Phase A Real Power	117	2117	2	1 W / bit	-2000000000 to +2211081215 W	-2000000000 W	32
Generator Phase B Real Power	119	2119	2	1 W / bit	-2000000000 to +2211081215 W	-2000000000 W	32
Generator Phase C Real Power	121	2121	2	1 W / bit	-2000000000 to +2211081215 W	-2000000000 W	32
Generator Phase A Apparent Power	123	2123	2	1 VA / bit	-2000000000 to +2211081215 VA	-2000000000 VA	32
Generator Phase B Apparent Power	125	2125	2	1 VA / bit	-2000000000 to +2211081215 VA	-2000000000 VA	32
Generator Phase C Apparent Power	127	2127	2	1 VA / bit	-2000000000 to +2211081215 VA	-2000000000 VA	32
Generator Phase A Reactive Power	129	2129	2	1 VAr / bit	-2000000000 to +2211081215 VAr	-2000000000 VAr	32

Generator Phase B Reactive Power	131	2131	2	1 VAr / bit	-2000000000 to +2211081215 VAr	-2000000000 VAr	32
Generator Phase C Reactive Power	133	2133	2	1 VAr / bit	-2000000000 to +2211081215 VAr	-2000000000 VAr	32
Generator Phase A Power Factor	135	2135	1	1/16384 / bit	-1.0 to 1.0	-1.0	16
Generator Phase B Power Factor	136	2136	1	1/16384 / bit	-1.0 to 1.0	-1.0	16
Generator Phase C Power Factor	137	2137	1	1/16384 / bit	-1.0 to 1.0	-1.0	16
Generator Total Apparent Power	138	2138	2	1 VA / bit	-2000000000 to +2211081215 VA	-2000000000 VA	32
Generator Total Percent kVA	140	2140	1	0.0078125 % / bit	-251 to 250.99 %	-251 %	16
Generator Total Reactive Power	141	2141	2	1 VAr / bit	-2000000000 to +2211081215 VAr	-2000000000 VAr	32
Generator Total Percent kVAr	143	2143	1	0.0078125 % / bit	-251 to 250.99 %	-251 %	16
Generator Total kW Hours Export	144	2144	2	1 kWh / bit	0 to 4211081215 kWh	0 kWh	32
Generator Total kVAr Hours Export	146	2146	2	1 kVArh/bit	0 to 4211081215 kVArh	0 kVArh	32
Generator Average Line-Neutral AC RMS Voltage	148	2148	1	1 V / bit	0 to 64255 V	0 V	16
Generator Front Bearing Temperature from Data Link	149	2149	1	0.03125 C / bit	-273 to 1735 C	-273 C	16

Generator Rear Bearing Temperature from Data Link	150	2150	1	0.03125 C / bit	-273 to 1735 C	-273 C	16
Generator Phase A Winding Temperature from Data Link	151	2151	1	0.03125 C / bit	-273 to 1735 C	-273 C	16
Generator Phase B Winding Temperature from Data Link	152	2152	1	0.03125 C / bit	-273 to 1735 C	-273 C	16
Generator Phase C Winding Temperature from Data Link	153	2153	1	0.03125 C / bit	-273 to 1735 C	-273 C	16
Generator Phase A Power Factor Lagging	159	2154	1	1 / bit	0 to 3	0	2
Generator Phase B Power Factor Lagging	160	2155	1	1 / bit	0 to 3	0	2
Generator Phase C Power Factor Lagging	161	2156	1	1 / bit	0 to 3	0	2
Generator Rear Bearing Temperature from I/O Pin	162	2157	1	0.03125 C / bit	-273 to 1735 C	-273 C	16
Generator Average Line-Line AC RMS Voltage Percent	163	2158	1	0.0078125 % / bit	-251 to 250.99 %	-251 %	16
Engine Oil Pressure	200	2159	1	0.125 kPa / bit	0 to 8031.875 kPa	0 kPa	16
Engine Coolant Temperature	201	2160	1	0.03125 C / bit	-273 to 1735 C	-273 C	16
Battery Voltage	202	2161	1	0.05 V / bit	0 to 3212.75 V	0 V	16
Engine rpm	203	2162	1	0.125 rpm / bit	0 to 8031.875 rpm	0 rpm	16

Engine Operating Hours	204	2163	2	0.05 hour / bit	0 to 210554060.75 hour	0 hr	32
Automatic Start/Stop State	206	2165	1	1 / bit	0 to 8	0	8
Spare Analog Input Percentage	207	2166	1	0.0078125 % / bit	-251 to 250.99 %	-251 %	16
Spare Analog Input Temperature	208	2167	1	0.03125 C / bit	-273 to 1735 C	-273 C	16
Spare Analog Input Pressure	209	2168	1	0.125 kPa / bit	0 to 8031.875 kPa	0 kPa	16
Service Maintenance Interval Hours Remaining	210	2169	1	1 hr / bit	-32127 to 32128 hr	-32127 hr	16
Service Maintenance Interval Days Remaining	212	2170	1	1 day / bit	-32127 to 32128 days	-32127 days	16
Number of Crank Attempts	213	2171	2	1 / bit	0 to 4211081215	0	32
Number of Successful Starts	215	2173	2	1 / bit	0 to 4211081215	0	32
Engine Oil Pressure from Data Link	217	2175	1	0.125 kPa / bit	0 to 8031.875 kPa	0 kPa	16
Engine Coolant Temperature from Data Link	219	2176	1	0.03125 C / bit	-273 to 1735 C	-273 C	16
Cylinder #1 Exhaust Port Temperature from Data Link	221	2177	1	0.03125 C / bit	-273 to 1735 C	-273 C	16
Cylinder #2 Exhaust Port Temperature from Data Link	222	2178	1	0.03125 C / bit	-273 to 1735 C	-273 C	16
Cylinder #3 Exhaust Port Temperature from Data Link	223	2179	1	0.03125 C / bit	-273 to 1735 C	-273 C	16

Cylinder #4 Exhaust Port Temperature from Data Link	224	2180	1	0.03125 C / bit	-273 to 1735 C	-273 C	16
Cylinder #5 Exhaust Port Temperature from Data Link	225	2181	1	0.03125 C / bit	-273 to 1735 C	-273 C	16
Cylinder #6 Exhaust Port Temperature from Data Link	226	2182	1	0.03125 C / bit	-273 to 1735 C	-273 C	16
Cylinder #7 Exhaust Port Temperature from Data Link	227	2183	1	0.03125 C / bit	-273 to 1735 C	-273 C	16
Cylinder #8 Exhaust Port Temperature from Data Link	228	2184	1	0.03125 C / bit	-273 to 1735 C	-273 C	16
Cylinder #9 Exhaust Port Temperature from Data Link	229	2185	1	0.03125 C / bit	-273 to 1735 C	-273 C	16
Cylinder #10 Exhaust Port Temperature from Data Link	230	2186	1	0.03125 C / bit	-273 to 1735 C	-273 C	16
Cylinder #11 Exhaust Port Temperature from Data Link	231	2187	1	0.03125 C / bit	-273 to 1735 C	-273 C	16
Cylinder #12 Exhaust Port Temperature from Data Link	232	2188	1	0.03125 C / bit	-273 to 1735 C	-273 C	16
Cylinder #13 Exhaust Port Temperature from Data Link	233	2189	1	0.03125 C / bit	-273 to 1735 C	-273 C	16
Cylinder #14 Exhaust Port Temperature from Data Link	234	2190	1	0.03125 C / bit	-273 to 1735 C	-273 C	16

Cylinder #15 Exhaust Port Temperature from Data Link	235	2191	1	0.03125 C / bit	-273 to 1735 C	-273 C	16
Cylinder #16 Exhaust Port Temperature from Data Link	236	2192	1	0.03125 C / bit	-273 to 1735 C	-273 C	16
Cylinder #17 Exhaust Port Temperature from Data Link	237	2193	1	0.03125 C / bit	-273 to 1735 C	-273 C	16
Cylinder #18 Exhaust Port Temperature from Data Link	238	2194	1	0.03125 C / bit	-273 to 1735 C	-273 C	16
Cylinder #19 Exhaust Port Temperature from Data Link	239	2195	1	0.03125 C / bit	-273 to 1735 C	-273 C	16
Cylinder #20 Exhaust Port Temperature from Data Link	240	2196	1	0.03125 C / bit	-273 to 1735 C	-273 C	16
Exhaust Manifold #1 Temperature from Data Link	241	2197	1	0.03125 C / bit	-273 to 1735 C	-273 C	16
Exhaust Manifold #2 Temperature from Data Link	242	2198	1	0.03125 C / bit	-273 to 1735 C	-273 C	16
Intake Manifold #1 Temperature from Data Link	243	2199	1	0.03125 C / bit	-273 to 1735 C	-273 C	16
Intake Manifold #2 Temperature from Data Link	244	2200	1	0.03125 C / bit	-273 to 1735 C	-273 C	16
Engine Oil Temperature from Data Link	245	2201	1	0.03125 C / bit	-273 to 1735 C	-273 C	16
Engine Fuel Temperature from Data Link	246	2202	1	0.03125 C / bit	-273 to 1735 C	-273 C	16
Fuel Pressure from Data Link	247	2203	1	0.125 kPa / bit	0 to 8031.875 kPa	0 kPa	16

Crankcase Pressure from Data Link	248	2204	1	1 / 128 kPa / bit	-250 to 251.99 kPa	-250 kPa	16
Boost Pressure from Data Link	249	2205	1	0.125 kPa / bit	0 to 8031.875 kPa	0 kPa	16
Oil Filter Differential Pressure from Data Link	251	2206	1	0.125 kPa / bit	0 to 8031.875 kPa	0 kPa	16
Fuel Filter Differential Pressure from Data Link	252	2207	1	0.125 kPa / bit	0 to 8031.875 kPa	0 kPa	16
Air Filter 1 Differential Pressure from Data Link	253	2208	1	1 / 128 kPa / bit	-250 to 251.99 kPa	-250 kPa	16
Total Fuel Consumption from Data Link	254	2209	2	0.5 L / bit	0 to 2105540607.5 L	0 L	32
Instantaneous Fuel Consumption from Data Link	256	2211	1	0.05 L/h per bit	0 to 3212.75 L/h	0 L/h	16
Atmospheric Pressure from Data Link	257	2212	1	0.125 kPa / bit	0 to 8031.875 kPa	0 kPa	16
Fuel Level from Data Link	258	2213	1	0.0078125 % / bit	-251 to 250.99 %	-251 %	16
Net Battery Current from Data Link	259	2214	1	1 A / bit	-125 to 125 A	-125 A	8
Engine Operating Mode	301	2215	1	1 / bit	0 to 2	0	8
System Event Count	334	2216	1				16
System Event Lamp Status	335	2217	1				16
Digital Input #1 Active State	600	2218	1	1 / bit	0 to 3	0	2
Digital Input #2 Active State	601	2219	1	1 / bit	0 to 3	0	2
Digital Input #3 Active State	602	2220	1	1 / bit	0 to 3	0	2

Digital Input #4 Active State	603	2221	1	1 / bit	0 to 3	0	2
Digital Input #5 Active State	604	2222	1	1 / bit	0 to 3	0	2
Digital Input #6 Active State	605	2223	1	1 / bit	0 to 3	0	2
Digital Input #7 Active State	606	2224	1	1 / bit	0 to 3	0	2
Digital Input #8 Active State	607	2225	1	1 / bit	0 to 3	0	2
Relay Output #1 Active State	616	2226	1	1 / bit	0 to 3	0	2
Relay Output #2 Active State	617	2227	1	1 / bit	0 to 3	0	2
Relay Output #3 Active State	618	2228	1	1 / bit	0 to 3	0	2
Relay Output #4 Active State	619	2229	1	1 / bit	0 to 3	0	2
Relay Output #5 Active State	620	2230	1	1 / bit	0 to 3	0	2
Relay Output #6 Active State	621	2231	1	1 / bit	0 to 3	0	2
Relay Output #7 Active State	622	2232	1	1 / bit	0 to 3	0	2
Relay Output #8 Active State	623	2233	1	1 / bit	0 to 3	0	2
Digital Output #1 Active State	624	2234	1	1 / bit	0 to 3	0	2
Digital Output #2 Active State	625	2235	1	1 / bit	0 to 3	0	2
Engine Oil Temperature from I/O Pin	800	2236	1	0.03125 C / bit	-273 to 1735 C	-273 C	16
Exhaust Temperature from I/O Pin	801	2237	1	0.03125 C / bit	-273 to 1735 C	-273 C	16
Left Manifold Exhaust Temperature from I/O Pin	802	2238	1	0.03125 C / bit	-273 to 1735 C	-273 C	16
Right Manifold Exhaust Temperature from I/O Pin	803	2239	1	0.03125 C / bit	-273 to 1735 C	-273 C	16

Fuel Level from I/O Pin	804	2240	1	0.0078125 % / bit	-251 to 250.99 %	-251 %	16
External Tank Fuel Level from I/O Pin	805	2241	1	0.0078125 % / bit	-251 to 250.99 %	-251 %	16
Engine Oil Level from I/O Pin	806	2242	1	0.0078125 % / bit	-251 to 250.99 %	-251 %	16
Engine Coolant Level from I/O Pin	807	2243	1	0.0078125 % / bit	-251 to 250.99 %	-251 %	16
Fire Extinguisher Pressure from I/O Pin	808	2244	1	0.125 kPa / bit	0 to 8031.875 kPa	0 kPa	16
Oil Filter Differential Pressure from I/O Pin	809	2245	1	0.125 kPa / bit	0 to 8031.875 kPa	0 kPa	16
Air Filter 1 Differential Pressure from I/O Pin	810	2246	1	1 / 128 kPa / bit	-250 to 251.99 kPa	-250 kPa	16
Fuel Filter Differential Pressure from I/O Pin	811	2247	1	0.125 kPa / bit	0 to 8031.875 kPa	0 kPa	16
Starting Air Pressure from I/O Pin	813	2248	1	0.125 kPa / bit	0 to 8031.875 kPa	0 kPa	16
Ambient Air Temperature from I/O Pin	814	2249	1	0.03125 C / bit	-273 to 1735 C	-273 C	16
Real Time Clock1	900	2250	1	1 / bit	-	0	16
Real Time Clock2	901	2251	1	1 / bit	-	0	16
Real Time Clock3	902	2252	1	1 / bit	-	0	16
Engine Status	1053	2253	1	1 / bit	0 to 5	0	8
Cooldown Duration Remaining	1054	2254	1	1 second / bit	0 to 64255 seconds	0 seconds	16
Genset Control Online	1090	2255	1	1 / bit	0 to 3	0	2

Engine Control Online	1091	2256	1	1 / bit	0 to 3	0	2
Secondary Engine Control Online	1092	2257	1	1 / bit	0 to 3	0	2
External I/O #1 Online	1093	2258	1	1 / bit	0 to 3	0	2
External I/O #2 Online	1094	2259	1	1 / bit	0 to 3	0	2
Digital AVR Online	1097	2260	1	1 / bit	0 to 3	0	2
RTD Module Online	1098	2261	1	1 / bit	0 to 3	0	2
Thermocouple #1 Online	1099	2262	1	1 / bit	0 to 3	0	2
Thermocouple #2 Online	1100	2263	1	1 / bit	0 to 3	0	2
Turbocharger 1 Compressor Inlet Temperature	2074	2264	1	0.03125 C / bit	-273 to 1735 C	-273 C	16
Turbocharger 2 Compressor Inlet Temperature	2075	2265	1	0.03125 C / bit	-273 to 1735 C	-273 C	16
Turbocharger 3 Compressor Inlet Temperature	2076	2266	1	0.03125 C / bit	-273 to 1735 C	-273 C	16
Turbocharger 4 Compressor Inlet Temperature	2077	2267	1	0.03125 C / bit	-273 to 1735 C	-273 C	16
Turbocharger 1 Turbine Inlet Temperature	2078	2268	1	0.03125 C / bit	-273 to 1735 C	-273 C	16
Turbocharger 1 Turbine Outlet Temperature	2079	2269	1	0.03125 C / bit	-273 to 1735 C	-273 C	16
Turbocharger 2 Turbine Inlet Temperature	2080	2270	1	0.03125 C / bit	-273 to 1735 C	-273 C	16
Turbocharger 2 Turbine Outlet Temperature	2081	2271	1	0.03125 C / bit	-273 to 1735 C	-273 C	16

Turbocharger 3 Turbine Inlet Temperature	2082	2272	1	0.03125 C / bit	-273 to 1735 C	-273 C	16
Turbocharger 3 Turbine Outlet Temperature	2083	2273	1	0.03125 C / bit	-273 to 1735 C	-273 C	16
Turbocharger 4 Turbine Inlet Temperature	2084	2274	1	0.03125 C / bit	-273 to 1735 C	-273 C	16
Turbocharger 4 Turbine Outlet Temperature	2085	2275	1	0.03125 C / bit	-273 to 1735 C	-273 C	16
Exhaust Temperature from Data Link	2086	2276	1	0.03125 C / bit	-273 to 1735 C	-273 C	16
Accessory Data Link Fault	N/A	2277,00	1	1 / bit	0 to1	0	1
Air Damper Closed	N/A	2277,01	1	1 / bit	0 to1	0	1
Battery Charger Failure	N/A	2277,02	1	1 / bit	0 to1	0	1
Communication Fault	N/A	2277,03	1	1 / bit	0 to1	0	1
Custom Event 1 High Shutdown	N/A	2277,04	1	1 / bit	0 to1	0	1
Custom Event 1 High Warning	N/A	2277,05	1	1 / bit	0 to1	0	1
Custom Event 1 Low Shutdown	N/A	2277,06	1	1 / bit	0 to1	0	1
Custom Event 1 Low Warning	N/A	2277,07	1	1 / bit	0 to1	0	1
Custom Event 2 High Shutdown	N/A	2277,08	1	1 / bit	0 to1	0	1
Custom Event 2 High Warning	N/A	2277,09	1	1 / bit	0 to1	0	1
Custom Event 2 Low Shutdown	N/A	2277,10	1	1 / bit	0 to1	0	1
Custom Event 2 Low Warning	N/A	2277,11	1	1 / bit	0 to1	0	1
Custom Event 3 High Shutdown	N/A	2277,12	1	1 / bit	0 to1	0	1
Custom Event 3 High Warning	N/A	2277,13	1	1 / bit	0 to1	0	1
Custom Event 3 Low Shutdown	N/A	2277,14	1	1 / bit	0 to1	0	1

Custom Event 3 Low Warning	N/A	2277,15	1	1 / bit	0 to1	0	1
Custom Event 4 High Shutdown	N/A	2278,00	1	1 / bit	0 to1	0	1
Custom Event 4 High Warning	N/A	2278,01	1	1 / bit	0 to1	0	1
Custom Event 4 Low Shutdown	N/A	2278,02	1	1 / bit	0 to1	0	1
Custom Event 4 Low Warning	N/A	2278,03	1	1 / bit	0 to1	0	1
Custom Event 5 High Shutdown	N/A	2278,04	1	1 / bit	0 to1	0	1
Custom Event 5 High Warning	N/A	2278,05	1	1 / bit	0 to1	0	1
Custom Event 5 Low Shutdown	N/A	2278,06	1	1 / bit	0 to1	0	1
Custom Event 5 Low Warning	N/A	2278,07	1	1 / bit	0 to1	0	1
Custom Event 6 High Shutdown	N/A	2278,08	1	1 / bit	0 to1	0	1
Custom Event 6 High Warning	N/A	2278,09	1	1 / bit	0 to1	0	1
Custom Event 6 Low Shutdown	N/A	2278,10	1	1 / bit	0 to1	0	1
Custom Event 6 Low Warning	N/A	2278,11	1	1 / bit	0 to1	0	1
Custom Event 7 High Shutdown	N/A	2278,12	1	1 / bit	0 to1	0	1
Custom Event 7 High Warning	N/A	2278,13	1	1 / bit	0 to1	0	1
Custom Event 7 Low Shutdown	N/A	2278,14	1	1 / bit	0 to1	0	1
Custom Event 7 Low Warning	N/A	2278,15	1	1 / bit	0 to1	0	1
Custom Event 8 High Shutdown	N/A	2279,00	1	1 / bit	0 to1	0	1
Custom Event 8 High Warning	N/A	2279,01	1	1 / bit	0 to1	0	1
Custom Event 8 Low Shutdown	N/A	2279,02	1	1 / bit	0 to1	0	1
Custom Event 8 Low Warning	N/A	2279,03	1	1 / bit	0 to1	0	1
Custom Event 9 High Shutdown	N/A	2279,04	1	1 / bit	0 to1	0	1

Custom Event 9 High Warning	N/A	2279,05	1	1 / bit	0 to1	0	1
Custom Event 9 Low Shutdown	N/A	2279,06	1	1 / bit	0 to1	0	1
Custom Event 9 Low Warning	N/A	2279,07	1	1 / bit	0 to1	0	1
Custom Event 10 High Shutdown	N/A	2279,08	1	1 / bit	0 to1	0	1
Custom Event 10 High Warning	N/A	2279,09	1	1 / bit	0 to1	0	1
Custom Event 10 Low Shutdown	N/A	2279,10	1	1 / bit	0 to1	0	1
Custom Event 10 Low Warning	N/A	2279,11	1	1 / bit	0 to1	0	1
Custom Event 11 High Shutdown	N/A	2279,12	1	1 / bit	0 to1	0	1
Custom Event 11 High Warning	N/A	2279,13	1	1 / bit	0 to1	0	1
Custom Event 11 Low Shutdown	N/A	2279,14	1	1 / bit	0 to1	0	1
Custom Event 11 Low Warning	N/A	2279,15	1	1 / bit	0 to1	0	1
Custom Event 12 High Shutdown	N/A	2280,00	1	1 / bit	0 to1	0	1
Custom Event 12 High Warning	N/A	2280,01	1	1 / bit	0 to1	0	1
Custom Event 12 Low Shutdown	N/A	2280,02	1	1 / bit	0 to1	0	1
Custom Event 12 Low Warning	N/A	2280,03	1	1 / bit	0 to1	0	1
Earth Fault	N/A	2280,04	1	1 / bit	0 to1	0	1
Earth Leakage	N/A	2280,05	1	1 / bit	0 to1	0	1
Emergency Stop Shutdown	N/A	2280,06	1	1 / bit	0 to1	0	1

Engine Controller Not Responding	N/A	2280,07	1	1 / bit	0 to1	0	1
Engine Failure To Start Shutdown	N/A	2280,08	1	1 / bit	0 to1	0	1
Engine In Coolantdown	N/A	2280,09	1	1 / bit	0 to1	0	1
Engine Over Speed Shutdown	N/A	2280,10	1	1 / bit	0 to1	0	1
Engine Under Speed Shutdown	N/A	2280,11	1	1 / bit	0 to1	0	1
Engine Under Speed Warning	N/A	2280,12	1	1 / bit	0 to1	0	1
Eps Supplying Load	N/A	2280,13	1	1 / bit	0 to1	0	1
Ext Tank High Fuel Level Shutdown	N/A	2280,14	1	1 / bit	0 to1	0	1
Ext Tank High Fuel Level Warning	N/A	2280,15	1	1 / bit	0 to1	0	1
Ext Tank Low Fuel Level Shutdown	N/A	2281,00	1	1 / bit	0 to1	0	1
Ext Tank Low Fuel Level Warning	N/A	2281,01	1	1 / bit	0 to1	0	1
Fuel Tank Leak	N/A	2281,02	1	1 / bit	0 to1	0	1
Generator Control Not In Auto Warning	N/A	2281,03	1	1 / bit	0 to1	0	1
Generator Over Current Shutdown	N/A	2281,04	1	1 / bit	0 to1	0	1
Generator Over Current Warning	N/A	2281,05	1	1 / bit	0 to1	0	1
Generator Over Frequency Shutdown	N/A	2281,06	1	1 / bit	0 to1	0	1
Generator Over Frequency Warning	N/A	2281,07	1	1 / bit	0 to1	0	1

Generator Over Voltage Shutdown	N/A	2281,08	1	1 / bit	0 to1	0	1
Generator Over Voltage Warning	N/A	2281,09	1	1 / bit	0 to1	0	1
Generator Reverse Power Shutdown	N/A	2281,10	1	1 / bit	0 to1	0	1
Generator Reverse Power Warning	N/A	2281,11	1	1 / bit	0 to1	0	1
Generator Under Frequency Shutdown	N/A	2281,12	1	1 / bit	0 to1	0	1
Generator Under Frequency Warning	N/A	2281,13	1	1 / bit	0 to1	0	1
Generator Under Voltage Shutdown	N/A	2281,14	1	1 / bit	0 to1	0	1
Generator Under Voltage Warning	N/A	2281,15	1	1 / bit	0 to1	0	1
Generatorerator Breaker Closed	N/A	2282,00	1	1 / bit	0 to1	0	1
Generatorerator Breaker Open	N/A	2282,01	1	1 / bit	0 to1	0	1
Generatorerator High Power Warning	N/A	2282,02	1	1 / bit	0 to1	0	1
High Air Filter Differential Pressure Shutdown	N/A	2282,03	1	1 / bit	0 to1	0	1
High Air Filter Differential Pressure Warning	N/A	2282,04	1	1 / bit	0 to1	0	1
High Ambient Air Temperature Shutdown	N/A	2282,05	1	1 / bit	0 to1	0	1

High Ambient Air Temperature Warning	N/A	2282,06	1	1 / bit	0 to1	0	1
High Battery Voltage Shutdown	N/A	2282,07	1	1 / bit	0 to1	0	1
High Battery Voltage Warning	N/A	2282,08	1	1 / bit	0 to1	0	1
High Engine Coolant Level Shutdown	N/A	2282,09	1	1 / bit	0 to1	0	1
High Engine Coolant Level Warning	N/A	2282,10	1	1 / bit	0 to1	0	1
High Engine Coolant Temperature Shutdown	N/A	2282,11	1	1 / bit	0 to1	0	1
High Engine Coolant Temperature Warning	N/A	2282,12	1	1 / bit	0 to1	0	1
High Engine Oil Level Shutdown	N/A	2282,13	1	1 / bit	0 to1	0	1
High Engine Oil Level Warning	N/A	2282,14	1	1 / bit	0 to1	0	1
High Engine Oil Temperature Shutdown	N/A	2282,15	1	1 / bit	0 to1	0	1
High Engine Oil Temperature Warning	N/A	2283,00	1	1 / bit	0 to1	0	1
High Exhaust Temperature Shutdown	N/A	2283,01	1	1 / bit	0 to1	0	1
High Exhaust Temperature Warning	N/A	2283,02	1	1 / bit	0 to1	0	1
High Fuel Filter Differential Pressure Shutdown	N/A	2283,03	1	1 / bit	0 to1	0	1

High Fuel Filter Differential Pressure Warning	N/A	2283,04	1	1 / bit	0 to1	0	1
High Fuel Level Shutdown	N/A	2283,05	1	1 / bit	0 to1	0	1
High Fuel Level Warning	N/A	2283,06	1	1 / bit	0 to1	0	1
High Gas Pressuresure Shutdown	N/A	2283,07	1	1 / bit	0 to1	0	1
High Gas Pressuresure Warning	N/A	2283,08	1	1 / bit	0 to1	0	1
High Generator Rear Bearing Temperature Shutdown	N/A	2283,09	1	1 / bit	0 to1	0	1
High Generator Rear Bearing Temperature Warning	N/A	2283,10	1	1 / bit	0 to1	0	1
High Generator Winding 1 Temperature Shutdown	N/A	2283,11	1	1 / bit	0 to1	0	1
High Generator Winding 1 Temperature Warning	N/A	2283,12	1	1 / bit	0 to1	0	1
High Generator Winding 2 Temperature Shutdown	N/A	2283,13	1	1 / bit	0 to1	0	1
High Generator Winding 2 Temperature Warning	N/A	2283,14	1	1 / bit	0 to1	0	1
High Generator Winding 3 Temperature Shutdown	N/A	2283,15	1	1 / bit	0 to1	0	1
High Generator Winding 3 Temperature Warning	N/A	2284,00	1	1 / bit	0 to1	0	1

High Left Exhaust Temperature Shutdown	N/A	2284,01	1	1 / bit	0 to1	0	1
High Left Exhaust Temperature Warning	N/A	2284,02	1	1 / bit	0 to1	0	1
High Oil Filter Differential Pressure Shutdown	N/A	2284,03	1	1 / bit	0 to1	0	1
High Oil Filter Differential Pressure Warning	N/A	2284,04	1	1 / bit	0 to1	0	1
High Right Exhaust Temperature Shutdown	N/A	2284,05	1	1 / bit	0 to1	0	1
High Right Exhaust Temperature Warning	N/A	2284,06	1	1 / bit	0 to1	0	1
High Starting Air Pressure Shutdown	N/A	2284,07	1	1 / bit	0 to1	0	1
High Starting Air Pressure Warning	N/A	2284,08	1	1 / bit	0 to1	0	1
Low Air Filter Differential Pressure Shutdown	N/A	2284,09	1	1 / bit	0 to1	0	1
Low Air Filter Differential Pressure Warning	N/A	2284,10	1	1 / bit	0 to1	0	1
Low Ambient Air Temperature Shutdown	N/A	2284,11	1	1 / bit	0 to1	0	1
Low Ambient Air Temperature Warning	N/A	2284,12	1	1 / bit	0 to1	0	1

Low Batt Cranking Voltage Warning	N/A	2284,13	1	1 / bit	0 to1	0	1
Low Battery Charging Sys Volt Warning	N/A	2284,14	1	1 / bit	0 to1	0	1
Low Battery Voltage Warning	N/A	2284,15	1	1 / bit	0 to1	0	1
Low Coolant Temperature Warning	N/A	2285,00	1	1 / bit	0 to1	0	1
Low Engine Coolant Level Shutdown	N/A	2285,01	1	1 / bit	0 to1	0	1
Low Engine Coolant Level Warning	N/A	2285,02	1	1 / bit	0 to1	0	1
Low Engine Oil Level Shutdown	N/A	2285,03	1	1 / bit	0 to1	0	1
Low Engine Oil Level Warning	N/A	2285,04	1	1 / bit	0 to1	0	1
Low Engine Oil Pressures Shutdown	N/A	2285,05	1	1 / bit	0 to1	0	1
Low Engine Oil Pressures Warning	N/A	2285,06	1	1 / bit	0 to1	0	1
Low Engine Oil Temperature Shutdown	N/A	2285,07	1	1 / bit	0 to1	0	1
Low Engine Oil Temperature Warning	N/A	2285,08	1	1 / bit	0 to1	0	1
Low Exhaust Temperature Shutdown	N/A	2285,09	1	1 / bit	0 to1	0	1
Low Exhaust Temperature Warning	N/A	2285,10	1	1 / bit	0 to1	0	1
Low Fuel Filter Differential Pressure Shutdown	N/A	2285,11	1	1 / bit	0 to1	0	1

Low Fuel Filter Differential Pressure Warning	N/A	2285,12	1	1 / bit	0 to1	0	1
Low Fuel Level Shutdown	N/A	2285,13	1	1 / bit	0 to1	0	1
Low Fuel Level Warning	N/A	2285,14	1	1 / bit	0 to1	0	1
Low Gas Pressuresure Shutdown	N/A	2285,15	1	1 / bit	0 to1	0	1
Low Gas Pressuresure Warning	N/A	2286,00	1	1 / bit	0 to1	0	1
Low Generator Rear Bearing Temperature Shutdown	N/A	2286,01	1	1 / bit	0 to1	0	1
Low Generator Rear Bearing Temperature Warning	N/A	2286,02	1	1 / bit	0 to1	0	1
Low Left Exhaust Temperature Shutdown	N/A	2286,03	1	1 / bit	0 to1	0	1
Low Left Exhaust Temperature Warning	N/A	2286,04	1	1 / bit	0 to1	0	1
Low Oil Filter Differential Pressure Shutdown	N/A	2286,05	1	1 / bit	0 to1	0	1
Low Oil Filter Differential Pressure Warning	N/A	2286,06	1	1 / bit	0 to1	0	1
Low Right Exhaust Temperature Shutdown	N/A	2286,07	1	1 / bit	0 to1	0	1
Low Right Exhaust Temperature Warning	N/A	2286,08	1	1 / bit	0 to1	0	1

Low Starting Air Pressure Shutdown	N/A	2286,09	1	1 / bit	0 to1	0	1
Low Starting Air Pressure Warning	N/A	2286,10	1	1 / bit	0 to1	0	1
Primary Data Link Fault	N/A	2286,11	1	1 / bit	0 to1	0	1
Service Maintenance Interval Warning	N/A	2286,12	1	1 / bit	0 to1	0	1
Utility Breaker Closed	N/A	2286,13	1	1 / bit	0 to1	0	1
Utility Breaker Open	N/A	2286,14	1	1 / bit	0 to1	0	1
WatchDog	N/A	2286,15	1	1 / bit	0 to1	0	1

Write Values							
Real Time Clock (Seconde/00)	N/A	2287	1	1 / bit	0000 to 6000	0	16
Real Time Clock (Heure/Minute)	N/A	2288	1	1 / bit	0000 to 2359	0	16
Real Time Clock (Month/Day)	N/A	2289	1	1 / bit	0101 to 1231	0	16
Real Time Clock (Year/00)	N/A	2290	1	1 / bit	0000 to 3500	0	16
Update Time Externe	N/A	2291	1	1 / bit	Write 1 for update Real Time Clock into EMRP3	0	1

9. Update the EMRP3

To update the EMRP3 software:

- Unplug the power of the screen.
- Insert the USB key into the USB drive located on the right hand side of the touch screen.
- Connect the power supply.
- When the EMRP3 restarts, you must choose to install the new program. Press OK
- Subsequently, the screen restarts and a password is then required.
- Enter the password located behind your EMRP3.
- When the EMRP3 is operational again, remove the USB key.
- The update is then completed.

10. Features

ENVIRONMENT

- **Conformity to standards :** EN 611 31-2, IEC 610-6-2, FCC (Class A), UL 508, UL 1604, CSA C22-2 n°14
- **Product certification :** cULus, CSA, Classe 1 Div 2 T4A ou T5 (UL and CSA), C-Tick, ATEX Zone 2/22
- **Temperature :** Operation: 0…50 °C, Storage : - 20…+ 60 °C
- **Relative humidity :** 0…90 % (non-condensing)
- **Degree of protection :** Front panel IP 65 conforming to IEC 60529, Nema 4X, Rear panel IP 20 conforming to IEC 60529
- **Shock resistance :** Conforming to IEC 60068-2-27; semi-sinusoidal pulse 11 ms, 15 gn on the 3 axes
- **Vibration :** Conforming to IEC 60068-2-6; 5…9 Hz at 3.5 mm; 9…150 Hz at 1 g
- **E.S.D. :** Conforming to IEC 61000-4-2, level 3
- **Electromagnetic interference :** Conforming to IEC 61000-4-3, 10 V/m
- **Electrical interference :** Conforming to IEC 61000-4-4, level 3

MECHANICAL CHARACTERISTICS

- **Mounting and fixing :** Mounting on 1.6…5 mm thick panel, Flush mounted, fixed by 4 screw clamps (included) or 2 spring clips (to be ordered separately)
- **Material :** Polycarbonate/polyethylene terephthalate alloy – Aluminium (front)

ELECTRICAL CHARACTERISTICS

- **Power supply :** Voltage : 24 VDC, Limits :19…28,8 VDC, Voltage break: ≤ 5 ms
- **Inrush current :** ≤ 30 A
- **Consumption :** 26 W

FUNCTIONAL CHARACTERISTICS

Screen :

LCD Colour TFT, 65 536 colours (16 384 if flashing)
Definition : 320 x 240 pixels (QVGA)
Size (width x height in mm) : 5,7" (11 5,2 x 86,4)
Touch-sensitive area : Analog, resolution 1024 x 1024
Brightness Adjustments: 8 levels via touch panel

- **Signalling :** 1 LED: green for normal operation, orange if backlighting faulty
- **Connections :** Power supply : Removable screw terminal block 3 terminals
- **Communication Protocol:** Model : EMRP3.X855TT Modbus TCP Master/Modbus TCP Slave

11. Models Available

- **EMRP3.2855TT** – EMCP3.2® controller communication via Modbus TCP/IP Master, Modbus TCP/IP Slave
- **EMRP3.2855TR** – EMCP3.2® controller communication via Modbus TCP/IP Master, Modbus RTU Slave
- **EMRP3.3855TT** – EMCP3.3® controller communication via Modbus TCP/IP Master, Modbus TCP/IP Slave
- **EMRP3.3855TR** – EMCP3.3® controller communication via Modbus TCP/IP Master, Modbus RTU Slave

12. References

For more information, refer to the manual:

- Caterpillar: Application and Installation Guide EMCP3.1, 3.2, 3.3 Generator set control - LEBE5255
- Schneider Electric : Magelis HMI STU 655/855 User Manual - EIO0000000614