mecc alte

POWER FROM WITHIN

MP250 CONTROLLER

SMARTECH
A DIVISION OF MECC ALTE

USER MANUAL

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Table of Contents

PREMISE

The manual must be kept with care and must always be available for quick reference. It must be read carefully and understood in every paragraph by the operator who must use the device and who will perform normal and periodic maintenance. If the manual is lost or damaged, request a copy from the installer / manufacturer, supplying the model, the part number, the serial number and the year of construction of the device.

1 Information on safety

Many accidents are caused by insufficient knowledge and not-applied safety rules during operation and/or maintenance operations.

To prevent accidents, before carrying out any operation and/or maintenance, read, understand and follow the precautions and warnings contained in this manual.

This manual contains the following indications:

WARNING! This indication is used in the safety messages of the manual when there are possible danger situations that may cause injuries or death.

INFORMATION! This term indicates that the message includes useful information for the current operation or procedures clarifications.

2 Maintenance and cleaning

The maintenance of this device must be performed by qualified personnel, in compliance with current regulations, to avoid damages to persons or property.

The front panel can only be cleaned with a soft cloth, do not use abrasive products, liquid detergents or solvents.

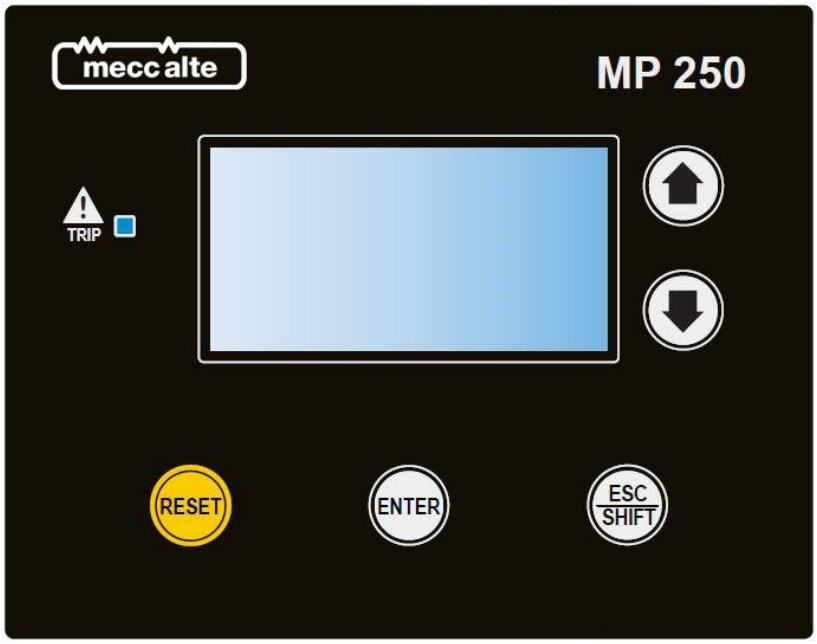
3 Disposal information

INFORMATION! Disposal of old electrical and electronic equipment (valid for European countries that have adopted separate collection systems).

Products bearing the symbol of a crossed-out wheeled bin cannot be disposed of together with normal household waste. Old electrical and electronic products must be recycled at a special facility that can handle these products and dispose of their components. To find out where and how to deliver these products to your nearest location, contact the appropriate municipal office. Proper recycling and disposal help to conserve nature and prevent harmful effects on health and the environment.

4 Main functions

4.1 MP250 Front panel



4.2 Push-buttons

Push-button		Function
	**UP**	It selects the previous page of the current menu; pressed for more than one second, it selects the previous menu. Together with the **SHIFT** button, it increases the display contrast. It increases the value of the selected setpoint during programming.
	**DOWN**	It selects the next page of the current menu; pressed for more than one second, it selects the next menu. Together with the **SHIFT** button, it decreases the display contrast. It decreases the value of the selected setpoint during programming.
	**RESET**	It performs a manual reset of all grid protections (if the auto-reset mode is not selected). It also resets all anomalies. It carries out the LAMP TEST of the TRIP led (while it is pressed). In programming, it allows to select the next digit during the editing process. **It forces a data / parameter saving into non-volatile memory: press this button and wait a few seconds before removing power supply.**
	**ENTER**	It silences the internal buzzer. It also recognizes all anomalies. It allows to entry into a submenu. In programming it starts and confirms the modification of a setpoint. Pressed together with the **EXIT** button: • When the controller is powered, it allows access to special functions. • During operation, it allows resetting the counters, clearing of the historical logs and reloading the defaults for the setpoints.

	**ESC / SHIFT**	It allows the exit from a submenu. In programming, it cancels the modification of a setpoint. Pressed together with the **ENTER** button: see above.

4.3 Indicators

LED OFF	LED steady ON	LED flashing
☐	▣	⧈

	Signalling		**Function**
	**TRIP**	▣	It indicates that at least one grid protection is tripped.
		⧈	It indicates that at least one anomaly is active.
		☐	No anomalies are present, and no grid protections are tripped.

4.4 Multifunctional display

4.4.1 LCD lighting

The back-light lamp is managed by the controller, which switches it off after a programmable delay (P.0492) without pressing any button. To turn it on again, simply press any button. This function can be disabled by setting parameter P.492 to 0.

4.4.2 Brightness adjustment

Depending on the environmental temperature conditions, it could be required a manual adjustment of the brightness to view the display correctly. Press in sequence the buttons **SHIFT + DOWN** to decrease it (lighten), press the buttons **SHIFT + UP** to increase it (darken).

4.4.3 Mode (menu) navigation

The display has different visualization modes, each composed by different pages:

Menu	
PROGRAM.	P.XX
STATUS	S.XX
MEASURES	M.XX
HISTORY	H.XX

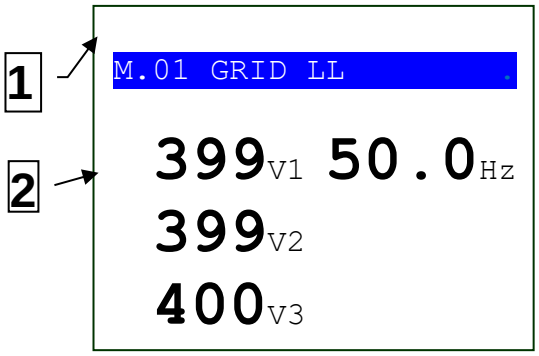
Multifunction display			
Press 1 sec	P.01	P.02	P.XX
	S.01	S.02	S.XX
	M.01	M.02	M.XX
	H.01	H.02	H.XX
			Press 1 sec

You can switch modes by holding down the **UP** or **DOWN** buttons for more than one second. Pressing them for less than a second, on the other hand, selects the pages within the current mode.

4.4.4 Structure of display areas

KEY:

1 Status bar
2 Data area

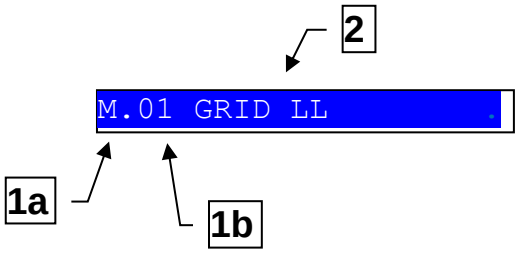


4.4.5 Top status bar

The top status bar contains information on navigation, times and/or some status information.

KEY:

1a Mode identifier
1b Page identifier
2 Title (description



The mode identifier (1a), and the page identifier (1b) identify and refer to the page so there is no chance of error. The title (description) is displayed in the current language.

The controller shows a special symbol (@) in the last character to the right of the top status bar when it is storing data / setpoints in the non-volatile memory: do not remove the power supply to the card at this stage.

4.4.6 Status information (S.XX)

This mode provides information on the status of the system. The different pages can be scrolled using the **UP** and **DOWN** navigation buttons.

- **S.01 STATUS.** It contains the grid status (indicates if no grid protection has tripped), the GCB feedback and the MCB feedback.
- **S.02 ANOMALIES**. The page is automatically displayed when a new anomaly is activated. For each anomaly, the page shows a letter that identifies the type ("A": alarm, "W": warning), a three-digit numeric code that uniquely identifies the anomaly and a description in the selected language. The code flashes if the anomaly has not yet been recognized with the **ENTER** button. The anomaly shown above is the most recent in chronological order.
- **S.03 USB.** It shows the communication status via the USB port (in progress, at rest).
- **S.04 DEVICE.** It displays the date/time, the unique identification code of the controller (ID code), the firmware revision and the power supply voltage. It also allows you to select the language for the display (press the **ENTER** button, select the language using the **UP** and **DOWN** buttons, confirm with **ENTER**). By default, the controller contains only the English language. Use BoardPrg4 to download additional languages to the device.

- **S.05 DIGITAL INPUTS.** It displays the status of the controller's digital inputs, both physical and virtual. By pressing the **ENTER** button, it is possible to alternate the display of the inputs between LOGICAL STATUS - *where the controller shows the logic levels of the inputs (active or inactive) used in the management of the operating sequence* - and PHYSICAL STATE - *in reverse, where instead the controller shows the electrical levels (active or inactive, or high or low) actually present on the inputs*.

- **S.06 DIGITAL OUTPUTS.** It displays the status of the controller's digital outputs. By pressing the **ENTER** button, it is possible to alternate the display of the outputs between LOGICAL STATUS - *where the* controller *shows the logical levels of the outputs (active or inactive) used in the management of the operating sequence* - and PHYSICAL STATE - *in reverse where instead the* controller *shows the actual commands (active or inactive) of the outputs*.

4.4.7 Electrical measures (M.XX)

In this mode, the measurements made by the controller on the grid are displayed. Furthermore, the status of all the grid protections is displayed. You can scroll through the different pages using the **UP** and **DOWN** navigation buttons.

- **M.01 GRID LL.** This page is only displayed for three-phases systems. It shows the line-to-line voltages, the frequency and the phases' sequence (clockwise or counter clockwise) of the grid.

- **M.02 GRID LN.** This page is shown for three-phases systems only if the system is configured to use the neutral connection (parameter P.0129 = 1). It is always displayed for single-phase systems. It shows the line-to-neutral voltages and the voltage between the neutral and the negative pole of the power supply. For single-phase systems it also displays the frequency.

- **M.03 GRID LL 10 min.** This page is only displayed for three-phases systems. It shows the 10 minutes rolling averages of the line-to-line voltages of the grid.

- **M.04 GRID LN 10 min.** This page is shown for three-phases systems only if the system is configured to use the neutral connection (parameter P.0129 = 1). It is always displayed for single-phase systems. It shows the 10 minutes rolling averages of the line-to-neutral voltages of the grid.

- **M.05 GRID V+/-/0.** This page is displayed only for three-phase systems. It shows the positive sequence (V +), negative sequence (V-) and zero sequence (V0) voltages. The controller can manage protections on these measures.

- **M.06 GRID PROTECTIONS.** This page shows the codes of the grid protections enabled (only those enabled): 27_1, 27_2, 27_3, 27_4, 27_5, 59_1, 59_2, 59_3, 59_4, 59_5, 59_AVG, V0, V +, V-, V_UNB, SEQ, 81U_1 , 81U_2, 81O_1, 81O_2, 81R-1, 81R-2, 81R-3, VS, EXT. The previous codes are displayed in negative if the relative protections have tripped.

- **M.07 M.08 M.09 M.10 PROTECTION COUNTERS.** These pages show the trip counters of the enabled grid protections (only those enabled). One line is used for each protection: on the left is shown the protection code (see previous point) and on the right the number of trips. Each page shows up to 7 counters, the number of displayed pages depends on the number of protections enabled. It is possible to reset all the counters (all together) by holding down the **ENTER** and **ESC** buttons for 5 seconds (when one of these pages is displayed).

4.4.8 History archives (H.XX)

These pages allow viewing of the historical archives managed by the controller.

Four types of archives are managed:

#	Description	Log capacity
1	Events	63
2	Fast analogue	63
3	Slow analogue	63
4	Peaks	13

The pages in this mode are organized differently from the M.XX and S.XX pages. They have a menu organization.

To access the archives, press the **ENTER** button for 1 second (several times if necessary), until the display shows page H.01 (if the programming menus are being displayed, press the **ESC** button repeatedly until display the page P.02, then do the procedure described above).

From the main page H.01, press the **ENTER** button to access the archive selection page. Use the **UP** and **DOWN** buttons to select the desired archive, then press the **ENTER** button to view the recordings of this archive.

Inside an archive, use the **UP** and **DOWN** buttons to scroll through the recordings. Use the **ENTER** or **SHIFT+ENTER** buttons to move between the various pages of a single recording. Press and hold the **ENTER+SHIFT** buttons simultaneously for at least 5 seconds to clear the displayed archive

To exit the archives, press the ESC button several times, until you return to page H.01.

4.4.9 Program (P.XX)

WARNING! Assigning an incorrect value to one or more parameters can cause malfunctions, damage to things or injury to people. The parameters must only be changed by qualified personnel. Parameters can be password protected.

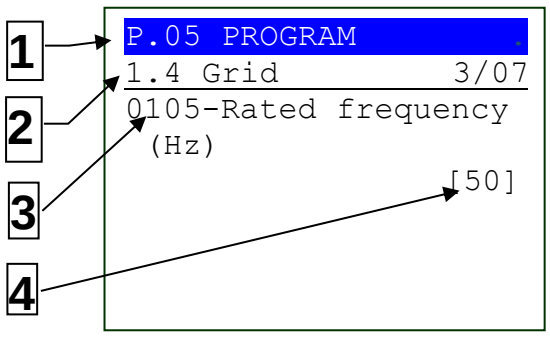
To access the program function, press the **ENTER** button for 1 second (several times if necessary), until the display shows page P.01 (if the archives menus are being displayed, press the **ESC** button repeatedly until display the page H.01, then do the procedure described above).

From the main page P.02, press the **ENTER** button to access the main programming menu. Use the **UP** and **DOWN** buttons to select a submenu, then press the **ENTER** button to enter it.

Press the **ESC** button to go back to the previous menu or to return to page P.02.

Once you have reached the desired submenu, use the **UP** and **DOWN** buttons to select the required parameter:

LEGEND:
1 – Status bar
2 – Current menu
3 – Current parameter
4 – Parameter's value



- The fourth and fifth rows show the unique code of the parameter (four digits) followed by the description in the current language.
- The sixth row shows, aligned to the right, the value of the parameter, enclosed in square brackets or between the "<>" symbols.
- For some parameter, the eighth row shows a value that is in some way related to the current value of the parameter. For example, in the case of the minimum frequency threshold (%), the frequency in Hz corresponding to the actual value of the parameter is shown. Often this additional measure is displayed when the parameter is expressed as a percentage with respect to some other value, to show its absolute value.

A parameter can only be changed if it is shown in square brackets ([]); if enclosed in "<>", it cannot be changed. In this case it may be necessary to set an appropriate password.

If the displayed parameter can be modified, pressing the **ENTER** button will start flashing the square brackets that enclose the value, indicating that the modification phase is in progress. To confirm the new value, press the **ENTER** button; to abort the change and return to the original value, just press the **ESC** button.

The value can be changed using the **UP** and **DOWN** buttons, respectively to increase or decrease the value of a unit (if these buttons are pressed together with **SHIFT**, the value will be increased or decreased by ten units at a time).

For the modification of "text" type parameters, the display shows (in reverse) the character currently selected in the string. The **UP** and **DOWN** buttons act on the selected character (moving to the next/previous in the ASCII table or to the one that follows it/precedes by ten positions if also pressed **SHIFT**), while the **RESET** button allows to select the character to be modified (cyclically).

Access to parameter programming can be influenced by three different password levels, listed in order of priority:

- Manufacturer password.
- Installer password.
- User password.

Each parameter of the controller is associated with a protection level. A parameter associated with the manufacturer level can only be changed by entering the manufacturer password. A parameter associated with the installer level can be modified by the manufacturer and the installer. A parameter associated with the user level can be modified by the manufacturer, installer and user.

The operator who wants to modify a parameter must first be recognized by the controller as "manufacturer", "installer" or "user" by typing the appropriate password in parameter P.0000 (menu "1 System → 1.1 Sa Security → 1.1.1 Authentication"). After this operation he can change the parameters, limited to those to which he has access based on his password level. The code entered will remain stored in P.0000 for a period of about 10 minutes from the end of programming. After this time will be automatically reset and must be reset to access the programming again.

Passwords can be customized using parameters P.0001 (manufacturer), P.0002 (installer) and P.0003 (user), available in the menu "1 System → 1.1 Security → 1.1.2 Password". The value "0" for these parameters indicates password not set.

If you lose a password, you can reconfigure it by accessing the higher-level password. For this reason, it is advisable to set at least the "manufacturer" password (P.0001): if someone sets it or a lower password (even if only by mistake) without communicating it, it will no longer be possible to change any parameters. By knowing the "manufacturer" password instead, it will be possible in any case to cancel or modify the other passwords. In case of loss of the "manufacturer" password it is necessary to contact Mecc Alte for assistance.

5 During operation

If during the operation a grid protection trips, the controller turns on the TRIP led and forces the display on the M.04 page, which will display the protection tripped in REVERSE. When the grid returns in tolerance, if automatic protections reset has not been selected, the operator can proceed with a manual reset by pressing the **RESET** button.

6 Setting date/time

The device includes a clock/calendar used mainly for recording events with date and time in historical archives.

The setting of the date/time is possible from the programming function. To update the time and/or the date of the controller, access menu "4.7.1 Date - Time" (the complete path is "1 System → 4 Auxiliary functions → 4.7 Device → 4.7.1 Date-Time".

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INSULATION SYSTEM

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