MERTECH SWITCHBOARDS LTD

AUTOMATIC TRANSFER SWITCH

INSTRUCTION MANUAL

ATL600 - ATL610

(GB)

AUTOMATIC TRANSFER SWITCH CONTROLLER

INSTRUCTIONS MANUAL

WARNING!
- Carefully read the manual before the installation or use.
- This equipment is to be installed by qualified personnel, complying to current standards, to avoid damages or safety hazards.

● *Before any maintenance operation on the device, remove all the voltages from measuring and supply inputs.*
● *Products illustrated herein are subject to alteration and changes without prior notice.*
● *Technical data and descriptions in the documentation are accurate, to the best of our knowledge, but no liabilities for errors, omissions or contingencies arising there from are accepted.*
● *A circuit breaker must be included in the electrical installation of the building. It must be installed close by the equipment and within easy reach of the operator.*
It must be marked as the disconnecting device of the equipment:
IEC /EN 61010-1 § 6.12.2.1.
● *Clean the instrument with a soft dry cloth; do not use abrasives, liquid detergents or solvents.*

Introduction

The Mertech Automatic Changeover Panels utilise the ATL600 and ATL610 control units which have been designed to offer state- of-the-art functions for automatic transfer switching applications between two three-phase sources, both utilities or generators. Built with dedicated components and extremely compact, the ATL600-ATL610 combine the modern design of the front panel with practical installation and LCD screen that provides a clear and intuitive user interface.

Description

- 2 control unit versions available:
  - ATL600 – base version, AC supply, non-expandable with EXP modules
  - ATL610 – expandable version (2 slots for EXP modules), double power supply AC/DC
- 128x80 pixel, backlit LCD screen with 4 grey levels.
- 5 keys for functions and setting.
- 4 LEDs for plant synoptic (source line and breakers status).
- 2 LEDs for alarm presence and AUTO mode active.
- 5-language text for measurements, settings and messages.
- Advanced programmable I/O functions.
- Fully user-definable alarm properties.
- High accuracy TRMS measurement.
- Line 1: 3-phase + neutral voltage reading input.
- Line 2: 3-phase + neutral voltage reading input.
- Switching between line-to-line, line-generator or generator-generator.
- Control of motorized circuit breakers, motorized changeover switches, or contactors.
- Management of automatic test for generators with emergency and rotation.
- Control of voltage source for three-phase, two-phase or single phase systems.
- Control of phase-phase and / or phase-neutral voltages.
- Controls of undervoltage, overvoltage, phase loss, asymmetry, minimum frequency, maximum frequency, with independent enabling and time delay.
- Voltage thresholds with programmable hysteresis.
- 12-24Vdc battery supply (ATL610)
- Front optical programming interface, galvanically isolated, high-speed, waterproof, compatible with USB dongle (CX01) and WiFi dongle (CX02).
- 6 programmable digital inputs (negative).
- 6 + 1 digital outputs:
  - 6 relays with NO contact 8A 250VAC.
  - 1 relays with changeover contact 8A 250VAC.
- Storage of the last 100 events.
- Front protection IP54, upgradable to IP65 with optional gasket.
- Compatible with App SAM1 and Synergy supervision software.

ATL600 – ATL610

MERTECH

Front buttons functions
OFF button - Selects the OFF operating mode.
AUT button - Selects the automatic mode. Green AUT LED lights.
MAN button - Select the manual operating mode.
▲ and ▼ keys - Used to scroll through the display pages or to select the list of options in a menu. Simultaneously pressing ▼ + ▲ calls up the *Main menu* with rotating icons.

Front LED
AUT LED (green) – Indicates that the automatic mode is active.
Alarm LED (red) – Flashing, indicates an active alarm.
Line 1 voltage status LED (green) - indicates that the line voltage source 1 is within the programmed limits.
Line 2 voltage status LED (green) - indicates that the line voltage source 2 is within the programmed limits.
Line 1 breaker status LED (yellow) - If I steady indicates the open or closed state of the source line 1 breaker. If flashing, indicates a mismatch between the desired state of the breaker and its true state detected by the feedback input.
Line 2 breaker status LED (yellow) - If I steady indicates the open or closed state of the source line 2 breaker. If flashing, indicates a mismatch between the desired state of the breaker and its true state detected by the feedback input.

Operating modes
To change the operating mode press for at least 0.5 sec the button correspondent to the desired mode.
OFF Mode - In this mode the device is disabled, and does not take any action. All views, both of the measures of the status LEDs remain active. If the control of the switching devices is impulsive, in OFF mode both open and close commands are disabled. If instead it is in continuous mode, the behaviour can be selected by P05.10. To access the programming menu is always necessary to enter in advance the OFF mode. Pressing the OFF-RESET button resets the retentive alarms, provided that the conditions that generated the alarm has been removed.
**MAN mode** (manual) - In MAN mode, you can manually control the switches on the display by selecting the switch that you want to control by pressing the MAN key, and pressing the ▲ or ▼ button to confirm the operation of closing or opening.
While the opening-closing of the breakers is enabled, the page scroll is locked. Pressing MAN several times it is possible to unlock it and to move through other display pages.
If is controlled manually closing a switch while the other is still closed, the unit will proceed before the opening of the other switch and then to the closure of the commanded one, inserting the interlock time programmed.
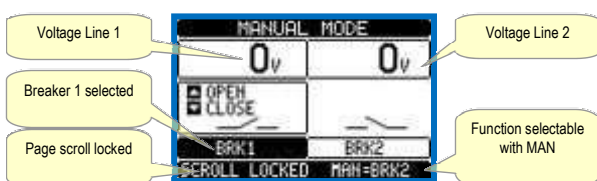
When working with the generators, you can manually control the switching on and off of the generator in a manner similar to that described for switches, but moving on the page start / stop groups.
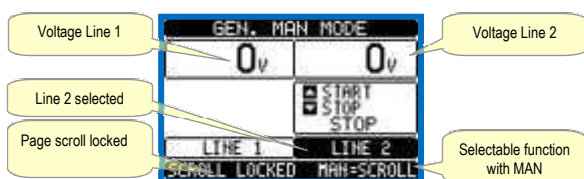
AUT mode (Automatic) - The AUT mode is highlighted by the lighting of the corresponding green LED. In automatic mode, the unit manages automatically the opening and closing of the breakers and the starting and

stopping of generator sets.
When the priority line voltage is out of bounds for a time longer than those set (line presence green LED turns off), the unit disconnects the load from the priority line and connect it to the secondary line, managing both start-up of any generator and interlock time delay. It is possible to program the unit to open the priority line breaker before or after the secondary line has been made available, through parameter P05.05 in the *M05 Changeover* menu.
When the priority line comes back within the limits, the unit will switch back the load on it and decide the possible cooling cycle of the generator. It is possible also to lock the automatic return to the priority line by means of parameter P05.12.
The cycles of automatic operation vary according to the type of application (utility-utility, utility-generator, generator-generator) and depending on the type of switching devices used (motorized breakers, motorized changeovers, contactors).

Power-up
- ATL600 has 100-240VAC supply.
- ATL610 has 100-240VAC or 12-24VDC supply. In the case of the simultaneous presence of both power supplies, priority is given to the AC power supply.
- After power-up the device normally starts in OFF mode.
- If you need the device to keep the same operation mode effective before switching off, you must change the parameter P01.03 in the *M01 Utilities menu*.
- ATL610 can be supplied either at either 12 or 24VDC, but the proper nominal battery voltage must be set in the menu *M05 Battery*, otherwise you will have an alarm related to the battery voltage.
- During power-up all the LEDS are made blinking in order to verify their operation.

Main menu
- The main menu is made up of a group of graphic icons (shortcuts) that allow rapid access to measurements and settings.
- Starting from normal viewing, press ▲ e ▼ keys together. The main menu screen is displayed.
- Press ▲ or ▼ to rotate clockwise/counter clockwise to select the required function. The selected icon is highlighted and the central part of the display shows the description of the function.
- Press ✓ to activate the selected function.
- If some functions are not available, the correspondent icon will be disabled, that is shown in a light grey colour.
- 🔲 🔲 🔲 etc. - Shortcuts that allow jumping to the first page of that group. Starting from that page it is still possible to move forward-backward in the usual way.
- 🔲 – Opens the password entry page, where it is possible to specify the numeric codes that unlock protected functions (parameter setting, commands menu).
- 🔲 – Access point to the setup menu for parameter programming. See dedicated chapter.
- 🔲 – Access point to the commands menu, where the authorised user can execute some clearing-restoring actions.
- 🔲 - Access point to the statistic data aout the controller operation.
- 🔲 - Access point to the Event log list.
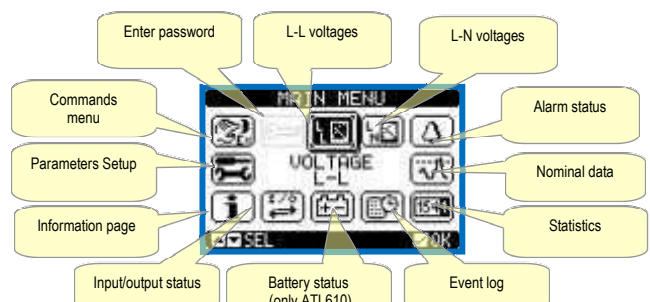
Main menu

Password access

- The password is used to enable or lock the access to setting menu (setup) and to commands menu.
- For brand-new devices (factory default), the password management is disabled and the access is free. If instead the passwords have been enabled and defined, then to get access, it is necessary to enter the password first, specifying the numeric code through the keypad.
- To enable password management and to define numeric codes, see setup menu.
- There are two access levels, depending on the code entered:
  - User-Level access – Allows clearing of recorded values and the editing of a restricted number of setup parameters.
  - Advanced access level – Same rights of the user access plus full settings editing-restoring.
- From normal viewing, press ✓ to recall main menu, select the password icon and press ✓.
- The display shows the screen in picture:

```
  ENTER PASSWORD
  ┌───────────────┐
  │ 0 0 0 0  ⌐o   │
  └───────────────┘
  ◄│► SEL  ▲▼ SET  ☑ OK
```
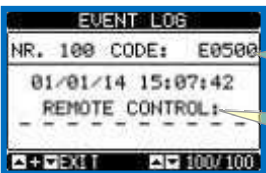
- Keys ▲ and ▼ change the selected digit
- Keys + and - move through the digits.
- Enter all the digits of the numeric code, then move on the *key* icon.
- If the password code entered matches the *User access code* or the *Advanced access code*, then the correspondent unlock message is shown.
- Once unlocked the password, the access rights last until:
  - the device is powered off.
  - the device is reset (after quitting the setup menu).
  - the timeout period of two minutes elapses without any keystroke.
- To quit the password entry screen press ✓ key.

Table of display pages

PAGES	EXAMPLE		
L-L Voltage	Line 1 / Measure unit / Frequency — L-L VOLTAGE — Line 2 / Phases indication / Operative Mode		
L-N Voltage	Voltage / Frequency — L-N VOLTAGE — Phases indication		
Alarms status	Active alarm — ALARMS STATUS		
Control thresholds	Line 1 / Voltage thresholds / Frequency thresholds — CONTROL THRESHOLDS — Line 2		

Statistics	MAN mode commutation counter / Time lapse with load supplied / Time lapse with lines out of the limits — STATISTICS — Line1 / Line 2 / AUT mode commutation counter / Contatore allarmi A03 A04 / Total time with no supplied load / ATL total power down counter / Time lapse with lines in the limits		
Battery status (ATL610 only)	Minimum voltage measured / Actual voltage / Minimum voltage limit — BATTERY STATUS — Maximum voltage measured / Maximum voltage limit / MAX and min voltages reset		
Installed expansion (ATL610 only)	Device model indication / Power supply / Optical port communication status — EXPANSION MODULES — Expansion installed indication		
I/O Status	INPUT/OUTPUT STATUS — Digital I/O state In reverse = enabled		
Input configurations	INPUTS		
Outputs configurations	OUTPUTS		
Virtual real time calendar clock	DATE / TIME		
Info page	Free user text — INFORMATION PAGE		
System info	Software Hardware Parameters revision level — SYSTEM INFO — Name of the ATS used		

Event List		

EVENT LOG
NR. 100 CODE: E0500
01/01/14 15:07:42
REMOTE CONTROL:
▲+▼EXIT ▲▼ 100/100

- Event code
- Description of event

Note: Some of the pages listed above may not be displayed if the relevant function is disabled. For example, if the Limit threshold function is not programmed, the corresponding page will not be shown.

Expandability

- Thanks to expansion bus, the ATL610 can be expanded with EXP… series modules.
- It is possible to connect a maximum of 2 EXP… modules at the same time.
- The supported EXP modules can be grouped in the following categories:
  - communication modules
  - digital I/O modules
- To insert an expansion module:
  - remove the power supply to ATL610
  - remove the protecting cover of one of the expansion slots
  - insert the upper hook of the module into the fixing hole on the left of the expansion slot
  - rotate right the module body, inserting the connector on the bus
  - push until the bottom clip snaps into its housing.

ATL610 expansion mounting

- When the ATL610 is powered on, it automatically recognises the EXP modules that have been mounted.
- If the system configuration has changed with respect to the last saved, (one module has been added or removed), the base unit asks the user to confirm the new configuration. In case of confirmation, the new configuration will be saved and will become effective, otherwise the mismatch will be shown at every subsequent power-on of the system.

CONFIGURATION CHANGE
ATL 610 | RS 232
NEW CONFIGURATION HAS BEEN FOUND SAVE OR RETRY
OFF RETRY | ☑ SAVE

- The actual system configuration is shown in the dedicated page of the display (expansion modules), where it is possible to see the number, the type and the status of the modules.
- The I/O numbering is shown under each module.
- The I/O status (active/not active) and communication channel status is highlighted with a reverse code.

Additional resources

- The expansion modules provide additional resources that can be used through the dedicated setup menus.
- The setup menus related to the expansions are always accessible, even if the expansion modules are not physically fitted.
- Since it is possible to add more than one module of the same typology (for instance two communication interfaces), the setup menus are multiple, identified by a sequential number.
- The following table indicates how many modules of each group can be mounted at the same time. The total number of modules must be less or equal than 2.

MODULE TYPE	CODE	FUNCTION	MAX Nr.
COMMUNICATION	EXP 10 10	USB	2
	EXP 10 11	RS-232	2
	EXP 10 12	RS-485	2
	EXP 10 13	Ethernet	1
	EXP 10 14	Profibus® DP	TBD
DIGITAL I/O	EXP 10 00	4 INPUTS	2
	EXP 10 01	4 STATIC OUTPUTS	2
	EXP 10 02	2 INPUTS + 2 ST. OUTPUTS	2
	EXP 10 03	2 CHANGEOVER RELAYS	2
	EXP 10 06	2 RELAYS NO	2
	EXP 10 07	3 RELAYS NO	2
	EXP 10 08	2 INPUTS + 2 RELAYS NO	2

Communication channels

- The ATL610 supports a maximum of 2 communication modules, indicated as COMn. The communication setup menu is thus divided into two sections (n=1 … 2) of parameters for the setting of the ports.
- The communication channels are completely independent, both for the hardware (physical interface) and for the communication protocol.
- The two channels can communicate at the same time.
- Activating the Gateway function it is possible to use an ATL610 with both an Ethernet port and a RS485 port, that acts as a bridge over other devices equipped with RS-485 only, in order to achieve a more economic configuration (only one Ethernet port).
- In this network, the ATL610 with Ethernet port will be set with both communication channels (two among COM1, COM2) with *Gateway* function set to ON, while the other devices will be configured normally with *Gateway* = OF.

Inputs, outputs, internal variables, counters

The inputs and outputs are identified by a code and a sequence number. For instance, the digital inputs are identified by code INPx, where x is the number of the input. In the same way, digital outputs are identified by code OUTx.

COD	DESCRIPTION	BASE	EXP (ATL610)
INPx	Digital Inputs	1…6	7…14
OUTx	Digital Outputs	1…7	8…15

- In a similar way, there are some internal bit-variables (markers) that can be associated to the outputs or combined between them. For instance, it is possible to apply some limit thresholds to the measurements done by the system. In this case, an internal variable named LIMx will be activated when the measurements will go outside the limits defined by the user through the dedicated setting menu.
- Furthermore, there are up to 4 counters (CNT1..CNT4) that can count pulses coming from an external source (through a digital input INPx) or the number of times that a certain condition as been verified. For instance, defining a limit threshold LIMx as the count source, it will be possible to count how many times one measurement has exceeded a certain limit.
- The following table groups all the I/O and the internal variables managed by the ATL600, with highlighting of their range (variables number per type) .

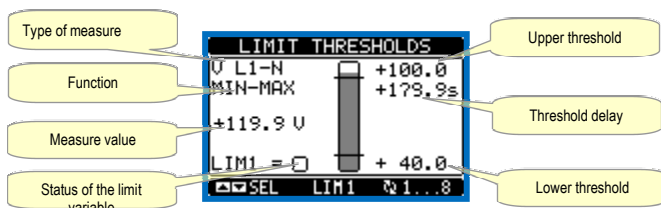| CODE	DESCRIPTION	RANGE
LIMx	Limit thresholds	1…4
REMx	Remote-controlled variables	1…16
UAx	User alarms	1…4
CNTx	Programmable counters	1…4

Limit thresholds (LIMx)

- The LIMn thresholds are internal variables whose status depends on the out-of-limits of one particular measurement set by the user (e.g. phase to phase voltage L1-L2 higher than 400V) among all those measured.
- To make the setting of the thresholds easier, since the limits can span in a very wide range, each of them can be set using a base number and a multiplier (for example: 400 x 1 = 400).
- For each LIM, there are two thresholds (upper and lower). The upper threshold must always be set to a value higher than the lower threshold.
- The meaning of the thresholds depends on the following functions:

Min function: the lower threshold defines the trip point, while the upper threshold is for the resetting. The LIM trips when the selected measurement is less than the Lower threshold for the programmed delay. When the measured value becomes higher than the upper set point, after the set delay, the LIM status is reset.
Max function: the upper threshold defines the trip point, while the lower threshold is for the resetting. The LIM trips when the selected measurement is more than upper threshold for the programmed delay. When the measured value decreases below the lower set point, after the delay, the LIM status is reset.
Max+Min function: both thresholds are for tripping. When the measured value is less than lower or more than upper set points, then, after the respective delays, the LIM will trip. When the measured value returns within the limits, the LIM status will be immediately reset.

- Trip denotes either activation or de-activation of the LIM variable, depending on 'Normal status' setting.
- If the LIMn latch is enabled, the reset can be done only manually using the dedicated command in the commands menu.
- See setup menu *M13 Limit thresholds* .

- Type of measure
- Function
- Measure value
- Status of the limit variable
- Upper threshold
- Threshold delay
- Lower threshold

Remote-controlled variables (REMx)

- ATL600 and ATL610 can manage up to 8 remote-controlled variables (REM1…REM8).
- Those are variables which status can be modified by the user through the communication protocol and that can be used in combination with outputs. Example: using a remote variable (REMx) as a source for an output (OUTx), it will be possible to freely energise or de-energise one relay through the supervision software. This allows to use the ATL600 relays to drive lighting or similar loads.

User Alarms (UAx)

- The user has the possibility to define a maximum of 4 programmable alarms (UA1…UA4).
- For each alarm, it is possible to define:
  - the *source* that is the condition that generates the alarm,
  - the *text* of the message that must appear on the screen when this condition is met.
  - the *properties* of the alarm (just like for standard alarms), that is in

which way that alarms interacts with the generator control.
- The condition that generates the alarm can be, for instance, the overcoming of a threshold. In this case, the source will be one of the limit thresholds LIMx.
- If instead, the alarm must be displayed depending on the status of an external digital input, then the source will be an INPx.
- For every alarm, the user can define a free message that will appear on the alarm page.
- The properties of the user alarms can be defined in the same way as the normal alarms. You can choose whether a certain alarm will stop the engine, activate the siren, close the global alarm output, etc. See chapter *Alarm properties*.
- When several alarms are active at the same time, they are displayed sequentially, and their total number is shown on the status bar.
- Pressing the OFF- RESET button can be reset retentive alarms, provided that the conditions that generated the alarm has been removed
- To reset one alarm that has been programmed with latch, use the dedicated command in the commands menu.
- For details on alarm programming and definition, refer to setup menu *M15 User alarms*.

Automatic test

- The automatic test is a periodic test carried out at set intervals (set during setup) if the system is in AUT mode and the function has been enabled.
- The typical application is to check the efficiency of a generating set used as an emergency power source.
- It is possible to decide in which days of the week the automatic test can be executed and at what time of the day (hours; minutes).
- See menu *M09 Automatic Test* for more details on automatic test programming.
- After starting, the gen-set runs for a set time, after which it will stop. The message 'A.TEST' is displayed before the generator starts.
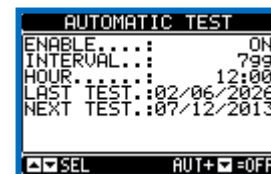
- The automatic test can be enabled/disabled without opening the Setup menu in the following way:
  - Open the 'AUTOMATIC TEST' page and press the keys **AUT** and ▲ to enable the function, or the keys **AUT** and ▼ to disable it.
- The automatic test can be stopped with the **OFF**-**RESET** key.

Simulation of priority line failure

- It is possible to simulate the lack of the priority line in order to verify the behavior of the transfer switch system.
- The simulation can be started either using the commands menu (command C.16) or via a digital input, for example connecting it to a key switch, programming the function of the input to the execution of the command C.16.
- The simulation consists in considering the priority line absent for 2 minutes, even if it is actually present. During this time the main page shows the message *SIMUL xxx* with the countdown of the time.
- The simulation will cause the start of the generator (if present) and a load transfer exactly as in the automatic cycle.
- You can stop the simulation at any time by passing in OFF mode.
- If you make the simulation through commands menu, you must start from the OFF mode (which allows access to the menu). Once selected and confirmed the C.16 command, exit the command menu. The unit will independently switch to AUT mode and start the simulation.

IR programming port
- The parameters of the ATL6.. can be configured through the front optical port, using the IR-USB CX01 programming dongle or with the IR-WiFi CX02 dongle.
- This programming port has the following advantages:
  - You can configure and service the ATL6.. without the need to access to the rear of the device or having to open the electrical panel.
  - It is galvanically isolated from the internal circuits of the ATL6.., guaranteeing the greatest safety for the operator.
  - High speed data transfer.
  - IP65 front panel.
  - Limits the possibility of unauthorized access with device config.
- Simply hold the CX.. dongle up to the front panel, connecting the plugs to the relevant connectors, and the device will be acknowledged as shown by the LINK LED on the programming dongle flashing green.

CX02 WiFi Dongle

Parameter setting (setup) with PC
- You can use the *ATL Remote control* set-up software to transfer (previously programmed) set-up parameters from the ATL6.. to the hard drive of the PC and vice versa.
- The parameter may be partially transferred from the PC to the ATL, transferring only the parameters of the specified menus.
- The PC can be used to set parameters and also the following:
  - Customised logo displayed on power-up and every time you exit keyboard setup.
  - Info page where you can enter application information, characteristics, data, etc.
  - Load alternative set of languages to default.

Parameters setting from your smartphone or tablet
- Using the SAM1 app, available for iOS or Android tablets and smartphones, together with the CX02 dongle, it is possible to connect to the ATL6 ...
- The APP allows you to view alarms, send commands, read measurements, set parameters, download the events and send data via e-mail.

SAM1 – smartphone

SAM1 – tablet

Parameter setting (setup) from front panel
- To open the parameters programming menu (setup):
  - Turn the unit in OFF mode
  - In normal measurements view, press ▲ ▼ simultaneously to call up the Main menu
  - Select the icon 🔧. If it is disabled (displayed in grey) you must enter the password (see chapter Password access).
  - Press ✓ to open the setup menu.
- The table shown in the illustration is displayed, with the settings sub-menus of all the parameters on the basis of their function.
- Select the required menu with keys ▲ or ▼ and confirm with ✓.
- Press **OFF** to quit and return to the measurement viewing.

Settings: menu selection

- The following table lists the available submenus:

Cod.	MENU	DESCRIPTION
M01	UTILITY	Language, brightness, display pages, etc.
M02	GENERAL	System specifications
M03	PASSWORD	Password settings
M04	BATTERY	Battery parameters (ATL610)
M05	CHANGEOVER	Load changeover settings
M06	LINE 1 CONTROL	Acceptability limits for line1 source
M07	LINE 2 CONTROL	Acceptability limits for line 2 source
M08	COMMUNICATIONS	Communications parameters (ATL610)
M09	AUTOMATIC TEST	Automatic test mode, duration, period
M10	DIGITAL INPUTS	Programmable digital inputs functions
M11	DIGITAL OUTPUTS	Programmable digital outputs functions
M12	MISCELLANEOUS	Functions like maintenance etc.
M13	LIMIT THRESHOLDS	Customisable limit thresholds
M14	COUNTERS	Programmable generic counters
M15	USER ALARM	Programmable alarms
M16	ALARM TABLE	Alarms effect enabling

- Select the sub-menu and press ✓ to show the parameters.
- Each parameter is shown with code, description and actual setting value.
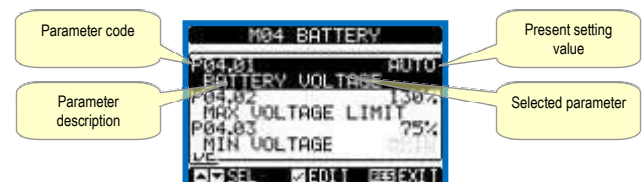
Set-up: parameter selection

- To modify the setting of one parameter, select it and then press ✓.
- If the Advanced level access code has not been entered, it will not be possible to enter editing page and an access denied message will be shown.
- If instead the access rights are confirmed, then the editing screen will be shown.
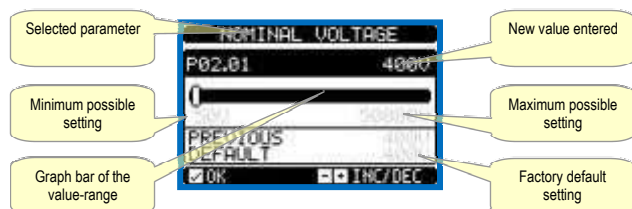
Set-up: editing page

- When the editing screen is displayed, the parameter setting can be modified with **+** and **-**keys. The screen shows the new setting, a graphic bar that shows the setting range, the maximum and minimum values, the previous setting and the factory default.
- Pressing **+** and ▲ the value is set to the maximum possible, while with ▲ and **-** it is set to the minimum.
- Pressing simultaneously + and - , the setting is set to factory default.
- During the entry of a text string, keys ▲ and ▼ are used to select the alphanumeric character while + and - are used to move the cursor along the text string. Pressing keys ▲ and ▼ simultaneously will move the character selection straight to character 'A'.
- Press ✓to go back to the parameter selection. The entered value is stored.
- Press **OFF** to save all the settings and to quit the setup menu. The controller executes a reset and returns to normal operation.
- If the user does not press any key for more than 2 minutes, the system leaves the setup automatically and goes back to normal viewing without saving the changes done on parameters.
- N.B.: a backup copy of the setup data (settings that can be modified using the keyboard) can be saved in the eeprom memory of the ATL…. This data can be restored when necessary in the work memory. The data backup 'copy' and 'restore' commands can be found in the commands menu.

Parameter table

M01 – UTILITY		UoM	Default	Range
P01.01	Language		English	English Italiano Francais Espanol Deutsch
P01.02	Set real time clock at power-on		OFF	OFF-ON
P01.03	Power-on operating mode		Previous	OFF mode Previous
P01.04	LCD contrast	%	50	0-100
P01.05	Display backlight intensity high	%	100	0-100
P01.06	Display backlight intensity low	%	25	0-50
P01.07	Time to switch to low backlighting	s	180	5-600
P01.08	Return to default page	s	300	OFF / 10-600
P01.09	Default page		VL-L	(page list)
P01.10	Plant identifier		(empty)	String 20 chr.

P01.01 – Select display text language.
P01.02 – Active automatic clock settings access after power-up.
P01.03 – Start system in OFF mode after power-up or in same mode it was switched off in.
P01.04 – Adjust LCD contrast.
P01.05 – Display backlight high adjustment.
P01.07 – Display backlight low delay.
P01.08 – Default page display restore delay when no key pressed. If set to OFF the display will always show the last page selected manually.
P01.09 – Default page displayed on power-up and after delay.
P01.10 – Free text with alphanumeric identifier name of specific plant.

M02 - GENERAL		UoM	Default	Range
P02.01	Nominal plant voltage	*VAC*	400	50-50000
P02.02	VT Use		OFF	OFF-ON
P02.03	VT Primary	V	100	50-50000
P02.04	VT Secondary	V	100	50-500
P02.05	Phase sequence control		OFF	OFF L1-L2-L3 L3-L2-L1
P02.06	Wiring mode		L1-L2-L3-N	L1-L2-L3-N L1-L2-L3 L1-N-L2 L1-N
P02.07	Voltage control mode		L-L	L-L L-N L-L + L-N
P02.08	Nominal frequency		50HZ	50 HZ 60 HZ

P02.01 – Rated voltage of LINE1 and LINE 2. Always set the line-to-line voltage for polyphase systems.
P02.02 – Using voltage transformers (TV) on LINE 1/ LINE 2 voltage metering inputs.
P02.03 – Primary value of any voltage transformers.
P02.04 – Secondary value of any voltage transformers.
P02.05 – Enable phase sequence control. **OFF** = no control. **Direct** = L1-L2-L3. **Reverse** = L3-L2-L1. Note: Enable also corresponding alarms.
P02.06 – Choosing the type of connection, three-phase with / without neutral, two-phase or single phase.
P02.07 – Voltage checks performed on concatenated, phase voltages or both.
P02.08 – Rated frequency LINE 1 / LINE 2.

M03 – PASSWORD		UoM	Default	Range
P03.01	Password enable		OFF	OFF-ON
P03.02	User level password		1000	0-9999
P03.03	Advanced level password		2000	0-9999
P03.04	Remote access password		OFF	OFF/1-9999

P03.01 – If set to OFF, password management is disabled and anyone has access to the settings and commands menu.
P03.02 – With P03.01 enabled, this is the value to specify for activating user level access. See Password access chapter.
P03.03 – As for P03.02, with reference to Advanced level access.
P03.04 – If set to a numeric value, this becomes the code to specify via serial communication before sending commands from a remote control.

M04– BATTERY		UoM	Default	Range
P04.01	Battery rated voltage	V	AUTO	AUTO 12 24
P04.02	MAX. voltage limit	%	130	110-140
P04.03	MIN. voltage limit	%	75	60-130
P04.04	MIN./MAX. voltage delay	s	10	0-120

P04.01 – Rated battery voltage.
P04.02 – Battery MAX. voltage alarm intervention threshold.
P04.03 – Battery MIN. voltage alarm intervention threshold.
P04.04 – Battery MIN. and MAX. alarms intervention delay.

M05 – LOAD CHANGEOVER		UoM	Default	Range
P05.01	Application type		U-G	U-G U-U G-G
P05.02	Priority line selection		-1-	-1- Line 1 -2- Line 2
P05.03	Linea 1 → Linea 2 interlock time	s	6.0	0.1…90.0
P05.04	Linea 1 ← Linea 2 interlock time	s	6.0	0.1…90.0
P05.05	Breaker open mode		OBP	OBP OAP
P05.06	Maximum operating switch time (A03 – A04 alarms delay)	s	5	1…900
P05.07	Changeover type		Brk. Pul.	Brk. Pul. Brk. Con. Chg. Pul. Chg. Con. Contactors
P05.08	Opening pulse duration	s	10	0-600
P05.09	Closing pulse duration	s	1	0-600
P05.10	Continuous command in RESET/OFF mode		NOC	OFF NOC
P05.11	Load no powered maximum time (A07 delay time)	s	60	OFF / 1…3600
P05.12	Inhibition automatic return on priority LINE		OFF	OFF / ON
P05.13	EJP mode		Normal	Normal EJP EJP-T SCR
P05.14	EJP start delay	min	25	0-240
P05.15	EJP Changeover delay	min	5	0-240
P05.16	ELP re-switching block		ON	OFF/ON
P05.17	Changeover on closing failure (only with open feedback)		OFF	OFF 1 2 1+2
P05.18	Minimum voltage coil pulse duration	s	1.0	0.1 … 10.0
P05.19	Delay between minimum coil and spring reload	s	0.2	0.1 … 10.0
P05.20	Closing retry		AUT	OFF AUT AUT+MAN
P05.21	Generator rotation interval		OFF	OFF 1h-2h-3h- 4h-6h-8h- 12h- 1d-2d-3d 4d-5d-6d-7d

P05.22	Generator rotation hour	h	0	0...23	
P05.23	Generator rotation minutes	min	0	0...59	

P05.01 – Defines the type of application for the control of one or two generator sets, enabling the management of the relevant input/output signals.

G = Utility to Generator
U-U = Utility to Utility
G-G = Generator to Generator

P05.02 – Defines which is the main line, i.e. the line taking on the load when both sources are available.

P05.03 – Time from the opening of the LINE 1 switchgear, after which the LINE 2 switchgear closing command is given.

P05.04 – Time from the opening of the LINE 2 switchgear, after which the LINE 1 switchgear closing command is given.

P05.05 – OBP (Open Before Presence) means that, in automatic mode, the open command of a circuit breaker is generated when the line concerned goes beyond limits, irrespective of the status of the alternative line.
OAP (Open After Presence) means that, in automatic mode, the open command of a circuit breaker is sent only after the alternative line is present within limits.

P05.06 – If, after sending an open or close command to a circuit breaker, this is not positioned correctly within this time, alarms A03 or A04 are generated. It works when the auxiliary contacts of circuit breaker status are programmed and wired.

P05.07 – Defines whether open-close outputs must be continuously active (application with contactors or circuit breakers without feedback) or in pulse mode, i.e. activated until the circuit breaker / switch has been positioned as required. If in pulse mode, the command is extended for a specified time (see P5.08 e P5.09) even after positioning completion.

P05.08 – Minimum duration of an opening command pulse. For the motorized circuit breaker application, it must be set to a time long enough to allow the load of the springs. This time is considered also when working in continuous mode.

P05.09 – Duration of the closing command pulse.

P05.10 – Defines the behaviour of the open/close command outputs when working in continuous command mode and ATL is in RESET/OFF mode. This parameter can be useful when working with contactors.
OFF – It opens the command outputs
NOC – No change on command output

P05.11 – If in automatic mode both sources are not available at the same time for a time exceeding P5.11, alarm A07 is generated.

P05.12 – If this parameter is enabled, after a transfer to the secondary line, restore to main line does not occur automatically when the latter becomes available again, but it must be commanded in manual mode.
OFF – Disabled
ON – Enabled

P05.13 – **Normal** = Standard operation in AUT mode. **EJP** = 2 programmable inputs are used, set with the functions *Remote starting off load* and *Remote changeover* for EJP. When the starting input closes the engine start (P05.14) delay is enabled, after which the start cycle runs. Then, when the remote switching go-ahead is received, if the engine started properly, the load will be switched from the mains to the generator. The load is restored to the mains by the remote switching go-ahead opening and the genset runs a stop cycle when the start input opens. The EJP function is only enabled if the system is in automatic mode. Tt cutouts and alarms function as usual. **EJP-T** = The EJP/T function is a simplified variation of the previous EJP, and in this case the engine start is controlled in the same way, but a timer switches the load instead of an external signal. This function therefore uses only one digital input, the starting input. The switching delay starts from when the start command closes, and can be set using parameter P05.15 *Changeover delay*. **SCR =** The SCR function is very similar to the EJP function. In this mode, the starting input enables genset starting as for EJP, without waiting for start delay P05.14. The remote changeover input still has a switching go-ahead function after *Changeover delay* P05.15.

P05.14 – Delay between the EJP start signal and the effective start signal sent to the generator.

P05.15 – Delay for switching the load from LINE 1 to LINE 2 in EJP and SCR mode.

P05.16 – If ON, in EJP , EJP-T and SCR mode, the load will not be switched back to the priority line in the case of a generator failure, but only when the signals on the EJP inputs give a go-ahead.

P05.17 – If enabled, in case of closing failure of the switching device (when feedback is opened while closing command active), in addition to the generation of the proper feedback alarm (A03 or A04) the load is switched to the alternative source. **OFF** = function disabled. **1** = check source line 1. **2** = check source line 2. **1+2** = check both source lines.

P05.18 – Duration of the opening pulse on the minimum voltage coils.

P05.19 – Time between the opening pulse on the minimum voltage coil and the spring reload command.

P05.20 – In case of use of motorized breakers, this parameter defines in which operating mode the ATL must execute the closing retry cycle. The closing retry is executed in case the breaker fails to close because the springs were not loaded. It consists of a complete opening and spring loading cycle, followed by the issuing of a new closing command. If the breaker fails to close again, then the A03 or A04 feedback alarm are generated.

P05.21– P05.22 - P05.23 These parameters allow to implement a time rotation in G-G applications, switching the priority between the two generators. P05.21 defines the rotation interval between the two generators. The time of the day when rotation will occur is defined by P05.22 and P05.23. If the rotation interval exceeds 24h, then rotation always occurs at the time stated every n days. Contrarily, if it is less than 24h, then it occurs at the time specified and also at submultiples. For instance, if you set time at 12:30 and rotation every 6h, there will be a changeover at 12:30, one at 18:30, one at 0:30, etc.

M06 – VOLTAGE CONTROL LINE 1		UoM	Default	Range
P06.01	MIN voltage limit for trip	%	85	70-100
P06.02	MIN voltage pick-up	%	90	70-100
P06.03	MIN voltage delay	s	5	0-600
P06.04	MAX voltage limit for trip	%	115	100-130 / OFF
P06.05	MAX voltage pick-up	%	110	100-130 / OFF
P06.06	MAX voltage delay	s	5	0-600
P06.07	Presence delay (when line 2 source not available)	s	10	1-6000
P06.08	Presence delay (when line 2 source available)	s	60	1-6000
P06.09	Phase failure threshold	%	70	60 – 80 OFF
P06.10	Phase failure delay	s	0.1	0.1s-30s
P06.11	MAX Asymmetry limit	%	15	1% -20%/OFF
P06.12	MAX Asymmetry delay	s	5	0.1-900
P06.13	MAX frequency limit	%	105	100-120/OFF
P06.14	MAX frequency delay	s	3	0-600
P06.15	MIN frequency limit	%	95	OFF/80-100
P06.16	MIN frequency delay	s	5	0-600
P06.17	LINE 1 control OFF mode		OFF	OFF ON OFF+GLOB ON+GLOB
P06.18	LINE 1 control MAN mode		OFF	OFF ON OFF+GLOB ON+GLOB
P06.19	Time delay generator starter due to a lack of LINE 1	s	OFF	OFF / 1-6000
P06.20	Generator cooling time	s	120	1-3600

P06.01, P06.02, P06.03 – The first two parameters define the minimum voltage threshold and the related hysteresis upon restore. P06.02 cannot be set to a lower value than P6.01. P6.03 defines the intervention delay of this protection.

P06.04, P06.05, P06.06 – The first two parameters define the maximum voltage threshold and the related hysteresis upon restore. P06.05 cannot be set to a value exceeding P06.04. Setting P06.04 to OFF will disable the maximum voltage control. P06.06 defines the maximum voltage intervention delay.

P06.07 – Delay for Line 1 restore to the limit range, used when the line 2 source is not available. Generally shorter than P06.08, as there is the urgent need to supply power because the load is not energized.

P06.08 – Delay for Line 1 restore to the limit range, used when the load can be connected to line 2. Generally longer than P06.07, as the load is energized and consequently it is possible to wait longer before considering voltage steadily restored.

P06.09, P06.10 – Voltage threshold below which a phase loss intervention occurs, generally quicker than the drop. The delay for the phase loss is specified by P06.10.

P06.11, P06.12 – P06.11 defines the maximum threshold for unbalance between phases, referred to voltage rating, and P06.12 defines the related intervention delay. This control may be disabled by setting P3.11 to OFF.

P06.13 – Max. frequency intervention threshold (can be disabled).

P06.14 – Max. frequency intervention delay.

P06.15 – Min. frequency intervention threshold (can be disabled).

P06.16 – Min. frequency intervention delay

P06.17 – OFF = LINE 1 voltage control in OFF mode disabled. **ON** = Voltage control in OFF mode enabled. **OFF+GBL** = Voltage control in OFF mode disabled, but the relay programmed with the global alarm function activates or not depending on whether the voltage is respectively absent or present. **ON+GBL** = Voltage control in OFF mode enabled, and the relay programmed with the global alarm function activates or not depending on whether the voltage is respectively absent or present.

P06.18 – See P06.17 with reference to MANUAL mode.

P06.19 – Engine start delay when LINE 1 fails to meet set limits. If set to OFF, the starting cycle starts when the mains contactor opens.

P06.20 – Max. duration of the cooling cycle. Example: time between load disconnection from the generator and when the engine actually stops.

M07 – VOLTAGE CONTROL LINE 2		UoM	Default	Range
P07.01	MIN voltage limit for trip	%	85	70-100
P07.02	MIN voltage pick-up	%	90	70-100
P07.03	MIN voltage delay	s	5	0-600
P07.04	MAX voltage limit for trip	%	115	100-130 / OFF
P07.05	MAX voltage pick-up	%	110	100-130 / OFF
P07.06	MAX voltage delay	s	5	0-600
P07.07	Presence delay (when line 1source not available)	s	10	1-6000
P07.08	Presence delay (when line 1 source available)	s	60	1-6000
P07.09	Phase failure threshold	%	70	60 – 80 OFF
P07.10	Phase failure delay	s	0.1	0.1s-30s
P07.11	MAX Asymmetry limit	%	15	1 -20 OFF
P07.12	MAX Asymmetry delay	s	5	0.1-900
P07.13	MAX frequency limit	%	105	100-120 OFF
P07.14	MAX frequency delay	s	3	0-600

P07.15	MIN frequency limit	%	95	OFF 80-100
P07.16	MIN frequency delay	s	5	0-600
P07.17	LINE 1 control OFF mode		OFF	OFF ON OFF+GLOB ON+GLOB
P07.18	LINE 1 control MAN mode		OFF	OFF ON OFF+GLOB ON+GLOB
P07.19	Time delay generator starter due to a lack of LINE 2	s	OFF	OFF / 1-6000
P07.20	Generator cooling time	s	120	1-3600

Note – For details on the functions of parameters see the menu M06 – VOLTAGE CONTROL LINE 1

M8 – COMMUNICATION (COMn, n=1…2)		UoM	Default	Range
P08.n.01	Node serial address		01	01-255
P08.n.02	Serial port speed	bps	9600	1200 2400 4800 9600 19200 38400 57600 115200
P08.n.03	Data format		8 bit – n	8 bit –no par. 8 bit, odd 8 bit, even 7 bit, odd 7 bit, even
P08.n.04	Stop bits		1	1-2
P08.n.05	Protocol		Modbus RTU	Modbus RTU Modbus ASCII Modbus TCP
P08.n.06	IP address		192.168.1.1	000.000.000.000 – 255.255.255.255
P08.n.07	Subnet mask		0.0.0.0	000.000.000.000 – 255.255.255.255
P08.n.08	IP port		1001	0-32000
P08.n.09	Channel funcion		Slave	Slave Gateway
P08.n.10	Client / server		Server	Client Server
P08.n.11	Remote IP address		000.000.000.000	000.000.000.000 – 255.255.255.255
P08.n.12	Remote IP port		1001	0-32000
P08.n.13	IP gateway address		000.000.000.000	000.000.000.000 – 255.255.255.255

Note: This menu is divided into 2 sections for communication channels COM1…2. The front IR communication port has fixed communication parameters, so no setup is required.
P08.n.01 – Serial (node) address of the communication protocol.
P08.n.02 – Communication port transmission speed.
P08.n.03 – Data format. 7 bit settings can be used for ASCII protocol only.
P08.n.04 – Stop bit number.
P08.n.05 – Select communication protocol.
P08.n.06…P08.n.08 – TCP-IP coordinates for Ethernet interface applications. Not used with other types of communication modules.
P08.n.09 – Role of the communication channel. Slave = Slave Modbus. Gateway = Bridge between the Ethernet and serial ports.
P08.n.10 – Enabling TCP-IP connection. Server = Awaits connection from a remote client. Client = Establishes a connection to the remote server.
P08.n.11…P08.n.13 – Coordinates for the connection to the remote server when P08.n.10 is set to Client.

M9 – AUTOMATIC TEST		UoM	Default	Range
P09.01	Enable automatic TEST		OFF	OFF / ON
P09.02	Time interval between TESTS	dd	7	1-60
P09.03	Enable TEST on Monday		ON	OFF / ON
P09.04	Enable TEST on Tuesday		ON	OFF / ON
P09.05	Enable TEST on Wednesday		ON	OFF / ON
P09.06	Enable TEST on Thursday		ON	OFF / ON
P09.07	Enable TEST on Friday		ON	OFF / ON
P09.08	Enable TEST on Saturday		ON	OFF / ON
P09.09	Enable TEST on Sunday		ON	OFF / ON
P09.10	TEST start time	h	12	00-23
P09.11	TEST start minutes	min	00	00-59
P09.12	TEST duration	min	10	1-600
P09.13	Automatic TEST with load switching		OFF	OFF Load Dummy load

P09.01 – Enable periodic test. This parameter can be changed directly on the front panel without using setup (see chapter Automatic Test) and its current state is shown on the relevant page of the display.
P09.02 – Time interval between one periodic test and the next. If the test isn't enabled the day period expires, the interval will be extended to the next enabled day.
P09.03…P09.09 Enables the automatic test in each single day of the week. OFF means the test will not be performed on that day. Warning!! The calendar clock must be set to the right date and time.
P09.10 – P09.11 Sets the time (hour and minutes) when the periodic test starts. Warning!! The calendar clock must be set to the right date and time.
P09.12 – Duration in minutes of the periodic test.
P09.13 – Load management during the periodic test: **OFF** = The load will not be switched. **Load** = Enables switching the load from the mains to the generator. **Dummy load** = The dummy load is switched in, and the system load will not be switched.

M10 – PROGRAMMABLE INPUTS (INPn, n=1…14)		UoM	Default	Range
P10.n.01	INPn input function		(various)	(see Input functions table)
P10.n.02	Function index (x)		OFF	OFF / 1…99
P10.n.03	Contact type		NO	NO/NC
P10.n.04	Closing delay	s	0.05	0.00-600.00
P10.n.05	Opening delay	s	0.05	0.00-600.00

Note: This menu is divided into 14 sections that refer to 6 possible digital inputs INP1…INP6, which can be managed by the ATL6… other 8 inputs can be managed by the ATL610 using the expansion module EXP….
P10. N.01 – Selects the functions of the selected input (see programmable inputs functions table).
P10. N.02 – Index associated with the function programmed in the previous parameter. Example: If the input function is set to *Cxx commands menu execution*, and you want this input to perform command C.07 in the commands menu, P10.n.02 should be set to value 7.
P10. N.03 – Select type of contact: NO (Normally Open) or NC (Normally Closed).
P10. N.04 – Contact closing delay for selected input.
P10. N.05 – Contact opening delay for selected input.

M11– PROGRAMMABLE OUTPUTS (OUT1…15)		UoM	Default	Range
P11.n.01	Output function OUTn		(various)	(see Output functions table)
P11. n.02	Function index (x)		1	OFF / 1…99
P11. n.03	Normal/reverse output		NOR	NOR / REV

Note: This menu is divided into 15 sections that refer to 7 possible digital outputs OUT1… OUT7 managed by the ATL6… , and other 9 inputs managed by the ATL610 using the expansion EXP…
P11. N.01 – Selects the functions of the selected output (see programmable outputs functions table).
P11. N.02 – Index associated with the function programmed in the previous parameter. Example: If the output function is set to *Alarm Axx*, and you want this output to be energized for alarm A16, then P11.n.02 should be set to value 16.
P11. N.03 – Sets the state of the output when the function associated with the same <u>is inactive</u>: **NOR** = output de-energized, **REV** = output energized.

M12 – MISCELLANEOUS		UoM	Default	Range
P12.01	Service interval in hours	h	OFF	OFF / 1…99999
P12.02	Service interval operations		OFF	OFF / 1…99999
P12.03	Operative mode output		OFF	OFF O M M – O A …

P12.01 – Defines the programmed maintenance period, in hours. If set to OFF, this service interval is disabled.
P12.02 – Defines the programmed maintenance period, in number of operations. If set to OFF, this service interval is disabled.
P12.03 – Defines in which operating mode the programmed output with the *Operating mode* function is enabled. For example, if this parameter is programmed for M –O, the *Operating mode* output will be enabled when the l'ATL6… is in MAN or OFF mode.

M13 – LIMIT THRESHOLDS (LIMn, n = 1…4)		UoM	Default	Range
P13.01	Reference measurement		OFF	OFF- (List measure) CNTx ….
P13.02	Reference measurement source		OFF	OFF LINE 1 LINE 2
P13.03	Channel no. (x)		1	OFF/1…99
P13.04	Function		Max	Max

					Min
					Min+Max
P13.05	Upper threshold			0	-9999 - +9999
P13.06	Multiplier			x1	/100 – x10k
P13.07	Delay	s		0	0.0 – 600.0
P13.08	Lower threshold			0	-9999 - +9999
P13.09	Multiplier			x1	/100 – x10k
P13.10	Delay	s		0	0.0 – 600.0
P13.11	Idle state			OFF	OFF-ON
P13.12	Memory			OFF	OFF-ON

Note: this menu is divided into 4 sections for the limit thresholds LIM1…4
P13.01 – Defines to which ATL… measurements the limit threshold applies.
P13.02 – If the reference measurement is an electrical measurement, this defines if it refers to the generator.
P13.03 – If the reference measurement is an internal multichannel measurement, the channel is defined.
P13.04 – Defines the operating mode of the limit threshold. **Max** = LIMn enabled when the measurement exceeds P13.n.03. P13.n.06 is the reset threshold. **Min** = LIMn enabled when the measurement is less than P13.n.06. P13.n.03 is the reset threshold. **Min+Max** = LIMn enabled when the measurement is greater than P13.n.03 or less than P13.n.06.
P13.05 and P13.06 – Define the upper threshold, obtained by multiplying value P13.n.03 by P13.n.04.
P13.07 – Upper threshold intervention delay.
P13.08, P13.09, P13.10 – As above, with reference to the lower threshold.
P13.11 – Inverts the state of limit LIMn.
P13.12 – Defines whether the threshold remains memorized and is reset manually through command menu (ON) or if it is reset automatically (OFF).

M14 – COUNTERS (CNTn, n = 1…4)		UoM	Default	Range
P14.01	Count source		OFF	OFF ON INPx OUTx LIMx REMx
P14.02	Channel number (x)		1	OFF/1…99
P14.03	Multiplier		1	1-1000
P14.04	Divisor		1	1-1000
P14.05	Description of the counter		CNTn	(Text – 16 characters)
P14.06	Unit of measurement		Umn	(Text – 6 characters)
P14.07	Reset source		OFF	OFF-ON-INPx-OUTx-LIMx-REMx
P14.08	Channel number (x)		1	OFF/1-99

Note: this menu is divided into 4 sections for counters CNT1..4
P14.01 – Signal that increments the count (on the output side). This may be a threshold is exceeded (LIMx), an external input is enabled (INPx), etc.
P14.02 – Channel number x with reference to the previous parameter.
P14.03 – Multiplier K. The counted pulses are multiplied by this value before being displayed.
P14.04 – Divisional K. The counted pulses are divided by this value before being displayed. If other than 1, the counter is displayed with 2 decimal points.
P14.05 – Counter description. 16-character free text.
P14.06 – Counter unit of measurement. 6-character free text.
P14.07 – Signal that resets the count. As long as this signal is enabled, the count remains zero.
P14.08 – Channel number x with reference to the previous parameter.

M15 – USER ALARMS (UAn, n=1…4)		UoM	Default	Range
P15.n.01	Alarm source		OFF	OFF INPx OUTx LIMx REMx
P15.n.02	Channel number (x)		1	OFF/1...99
P15.n.03	Text		UAn	(text – 20 char)
P15.n.04	Breaker opening		OFF	OFF 1 2 1+2

Note: this menu is divided into 4 sections for user alarms UA1…UA4.

P15.01 – Defines the digital input or internal variable that generates the user alarm when it is activated.
P15.02 – Channel number x with reference to the previous parameter.
P15.03 – Free text that appears in the alarm window.
P15.04 – Line to open in case of this alarm.

Example of application: User alarm UA3 must be generated by the closing of input INP5, and must display the message 'Panels open'.
In this case, set the section of menu 3 (for alarm UA3):
P15.3.01 = INPx
P15.3.02 = 5
P15.3.03 = "Panels open"

Alarms

- When an alarm is generated , the display will show an alarm icon, the code and the description of the alarm in the language selected.

- If the navigation keys in the pages are pressed, the pop-up window showing the alarm indications will disappear momentarily, to reappear again after a few seconds.
- The red LED near the alarm icon on the front panel will flash when an alarm is active. In the area of synoptic on the display remains a flashing icon that represents the type of the alarm.
- Alarms can be reset by pressing the key **OFF.**
- If the alarm cannot be reset, the problem that generated the alarm must still be solved.
- In the case of one or more alarms, the behaviour of the ATL6.. depends on the *properties* settings of the active alarms.

Alarm properties

Various properties can be assigned to each alarm, including user alarms (*User Alarms*, Uax):

- **Alarm enabled** – General enabling of the alarm. If the alarm isn't enabled, it's as if it doesn't exist.
- **Only AUT** – The alarm can be generated only when ATL is in AUT operating mode.
- **Retained alarm** – Remains in the memory even if the cause of the alarm has been eliminated.
- **Global alarm** – Activates the output assigned to this function.
- **BRK1 Locked**– When the alarm is active, no commands are sent to breaker 1.
- **BRK2 Locked** – Like previous property, referred to breaker 2.
- **Siren** – Activates the output assigned to this function, as configured in the alarm table.
- **I**n**hibition** – The alarm can be temporarily disabled by activating an input that can be programmed with the Inhibit alarms function.
- **No LCD** – The alarm is managed normally, but not shown on the display.

Alarm table

COD	DESCRIPTION	Enabled	Only AUT	Retained	Glob. Al.	Lock BRK1	Lock BRK2	Siren	Inhibit.	No LCD
A01	Battery voltage too low	•		•	•			•		
A02	Battery voltage too high	•		•	•			•		
A03	Line 1 circuit breaker timeout	•	•	•	•	•		•		
A04	Line 2 circuit breaker timeout	•	•	•	•		•	•		
A05	Line 1 wrong phase sequence	•		•	•			•		
A06	Line 2 wrong phase sequence	•		•	•			•		
A07	Timeout load not powered	•	•		•					
A08	External battery charger failure									
A09	Emergency	•		•	•			•		
A10	Line 1 breaker protection trip	•		•	•	•	•	•		
A11	Line 2 breaker protection trip	•		•	•	•	•	•		
A12	Line 1 generator not available	•			•			•		
A13	Line 2 generator not available	•			•			•		
A14	Line 1 maintenance hours elapsed	•								
A15	Line 2 maintenance hours elapsed	•								
A16	Line 1 Maintenance operations	•								
A17	Line 2 Maintenance operations	•								
A18	Auxiliary voltage failure	•			•			•		

Alarm description

COD	DESCRIPTION	ALARM EXPLANATION
A01	Battery voltage too low	Battery voltage beyond the lowest threshold for a time exceeding the time set.
A02	Battery voltage too high	Battery voltage beyond the highest threshold for a time exceeding the time set.
A03	Line 1 circuit breaker timeout	The LINE 1 changeover device did not perform the opening or closing operation within the max. time set. After alarm generation, the opening or closing command is inhibited. Alarms are generated only if at least one of the two power sources is present, i.e. if it is higher that the minimum thresholds programmed.
A04	Line 2 circuit breaker timeout	The LINE 2 changeover device did not perform the opening or closing operation within the max. time set. After alarm generation, the opening or closing command is inhibited. Alarms are generated only if at least one of the two power sources is present, i.e. if it is higher that the minimum thresholds programmed.
A05	Line 1 wrong phase sequence	The phase sequence recorded on LINE 1 does not correspond to the one programmed.
A06	Line 2 wrong phase sequence	The phase sequence recorded on LINE 2 does not correspond to the one programmed.
A07	Load not powered timeout	The load has been without power for a time longer than the maximum specified with P05.11, either because both source lines were absent or because both the breakers remained open.
A08	External battery charger failure	Alarm generated by an input with the function *Battery charger alarm*, while at least one of the source lines source is in the correct limits.
A09	Emergency	Alarm generated by the opening of the external input with *Emergency* function. Both breakers will be opened.
A10	Line 1 breaker protection trip	Line 1 breaker has tripped because of an overcurrent protection, signalled by activation of the input with function *Line 1 breaker protection trip*.
A11	Line 2 breaker protection trip	Line 2 breaker has tripped because of an overcurrent protection, signalled by activation of the input with function *Line 2 breaker protection trip*.
A12	Line 1 generator not available	Alarm generated by the input *Generator Line 1 ready*.
A13	Line 2 generator not available	Alarm generated by the input *Generator Line 2 ready*.
A14	Maintenance hours line 1	Alarm generated when the maintenance hours for LINE 1 arrive to zero. See M12 menu. Use the command menu to restore the working hours and reset the alarm.
A15	Maintenance hours line 2	Alarm generated when the maintenance hours for LINE 2 arrive to zero. See M12 menu. Use the command menu to restore the working hours and reset the alarm.
A16	Maintenance operations line 1	Alarm generated when the number of operations for LINE 1 reach the value sated in the menu M12. Use the menu commands to restore the function and reset the alarm.
A17	Maintenance operations line 2	Alarm generated when the number of operations for LINE 2 reach the value sated in the menu M12. Use the menu commands to restore the function and reset the alarm.
A18	Auxiliary voltage failure	The device that manages the draw of auxiliary power supply from one of the available lines (like Lovato ATLDPS1) signals a failure or improper operation.
UA1 … UA4	User alarms	The user alarm is generated by enabling the variable or associated input in menu M15.

Programmable inputs function table

- The following table shows all the functions that can be attributed to the INPn programmable digital inputs.
- Each input can be set for an reverse function (NA – NC), delayed energizing or de-energizing at independently set times.
- Some functions require another numeric parameter, defined in the index (x) specified by parameter **P10.n.02**.
- See menu *M10 Programmable inputs* for more details.

Function	Description
Disabled	Input disabled
Configurable	Free user configuration
Line 1 breaker closed (Feedback 1)	Auxiliary contact informing the ATL of the open/closed status of line 1 circuit breaker. If this signal is not
Line 2 breaker closed (Feedback 2)	connected, ATL considers the status of the circuit breaker corresponding to the status of control outputs. Like Fb.1, referred to line 2
Line 1 circuit breaker protection (Trip 1)	When the contact is closed, it generates an alarm of line 1 circuit breaker protection intervention
Line 2 circuit breaker protection (Trip 2)	When the contact is closed, it generates an alarm of line 2 circuit breaker protection intervention
Transfer to secondary line (remote start on-load)	When closed, causes changeover to secondary line even if main line voltage is within limits. The secondary line circuit breaker remains activated until this line remains within limits. Can be used for EJP function
Inhibit Return to main line	In AUT mode, when closed, it inhibits the return to main line after it has reverted to the limit range. It is used to prevent the second power cut out due to re-transfer from occurring automatically at an unforeseeable time
Start Generator	In AUT mode, when closed, it causes the generator to start after the delay specified by P2.26. It can be used for EJP function
Emergency	NC contact which, if open, causes both circuit breakers to open and generates alarm A09
Generator ready 1	When closed it signals that the generator connected to line 1 is available for use. If this signal is missing, alarm A12 is generated
Generator ready 2	When closed it signals that the generator connected to line 2 is available for use. If this signal is missing, alarm A13 is generated
External LINE 1 control	Line 1 voltage control signal from external device. Enabled indicates the voltage is within the limits
External LINE 2 control	Line 2 voltage control signal from external device. Enabled indicates the voltage is within the limits
Enable Load on line 1	It allows load connection on line 1, in addition to internal controls.
Enable Load on line 2	Like previous, referred to line 2
Delay 1 bypass	Reset the delay presence on line 1
Delay 2 bypass	Reset the delay presence on line 2
Keypad lock	If closed, it locks all the functions from front keypad except measure viewing
Lock Parameters	If closed, it locks the access to setup menus
Lock remote control	If closed, locks write access through serial interface ports
Siren OFF	Disable the siren
Automatic test	Starts the periodic test managed by an external timer
Battery charger alarm	With the input enabled, generates the alarm *A08* External battery charger fault. The alarm is only generated when there is mains voltage
Alarms inhibition	If enabled, disables the alarms that have the property *Inhibit alarms* activated
Alarms reset	Resets the retained alarms for which the condition that triggered the same has ceased
Command menu C(xx)	Executes the command from the commands menu defined by index parameter (xx)
Key OFF simulation	Closing the input is the equivalent of pressing the key.
Key MAN simulation	Closing the input is the equivalent of pressing the key.
Key AUT simulation	Closing the input is the equivalent of pressing the key.
Automatic test inhibition	Inhibits the automatic test
LED Test	Makes all the LEDS on the front panel flash
Breaker 1 closing	Close the breaker 1 in manual mode
Breaker 1 opening	Open the breaker 1 in manual mode
Breaker 1 toggling	Toggle the breaker 1 in manual mode
Breaker 2 closing	Close the breaker 2 in manual mode
Breaker 2 opening	Open the breaker 2 in manual mode
Breaker 2 toggling	Toggle the breaker 2 in manual mode
Auxiliary voltage ready	NC contact which, if open, it generates alarm A18. Used for example in conjunction with the alarm relay of ATLDPS1 device
Revision	In case of revision of the system, if enabled, causes: • Switch in OFF mode • Disabling alarms feedback A03 - A04 • Excitement of any undervoltage coils

Output function table

- The following table shows all the functions that can be attributed to the OUTn programmable digital inputs.
- Each output can be configured so it has a normal or reverse (NOR or REV) function.
- Some functions require another numeric parameter, defined in the index (x) specified by parameter **P11.n.02**.
- See menu *M11 Programmable outputs* for more details.

Function	Description
Disabled	Output disabled
Configurable	User configuration free
Close line 1 contactor/circuit breaker	Command to close line 1 contactor/circuit breaker
Open line 1 circuit breaker	Command to open line 1 circuit breaker and eventual spring load
Close line 2 contactor/circuit breaker	Command to close line 2 contactor/circuit breaker
Open line 2 circuit breaker	Command to open line 1 circuit breaker and eventual spring load
Open line 1 / line 2	Open both circuit breakers/neutral position of motorized changeover
Min Coil line 1	Controls the minimum voltage coil, opening breaker 1 before the spring load cycle
Min Coil line 2	Controls the minimum voltage coil, opening breaker 2 before the spring load cycle
Line 1 generator control	Start /Stop remote control of line 1 generator
Line 2 generator control	Start /Stop remote control of line 2 generator
ATS ready	ATS in automatic mode, without alarms, ready to switch
Global alarm	Output enabled in the presence of any alarm with the Global alarm propriety enabled
Line 1 status	Output energized when there are all conditions to be able to connect the load to the line 1
Line 2 status	Output energized when there are all conditions to be able to connect the load to the line 2
Siren	Powers the siren.
Operating mode	Output energized when the RGK600 is in one of the modes set with parameter P23.13
OFF mode	Energized when the ATL6... is OFF
MAN mode	Energized when the ATL6... is in MANUAL mode
AUT mode	Energized when the ATL6... is in AUT mode
REM(x) remote variable	Output controlled by remote variable REMx (x=1..16)
LIM limits (x)	Output controlled by the state of the limit threshold LIM(x) (x=1..4) defined by the index parameter
Dummy load	Output enabled when you run the self-test with dummy load
Load connected to line 1	Breaker 1 closed
Load connected to line 2	Breaker 2 closed
Alarms A01-Axx	Output energized with alarm Axx is enabled (xx=1…alarms number)
Alarms UA1..Uax	Output energized with alarm Uax is enabled (x=1…4)

Commands menu

- The commands menu allows executing some occasional operations like reading peaks resetting, counters clearing, alarms reset, etc.
- If the Advanced level password has been entered, then the commands menu allows executing the automatic operations useful for the device configuration.
- The following table lists the functions available in the commands menu, divided by the access level required.

COD.	COMMAND	ACCESS LEVEL	DESCRIPTION
C01	Reset maintenance 1	Advanced	Reset maintenance interval hours 1
C02	Reset maintenance 2	Advanced	Reset maintenance interval hours 2
C03	Reset maintenance operations 1	Advanced	Reset maintenance interval operations 1
C04	Reset maintenance operations 2	Advanced	Reset maintenance interval operations 2
C05	Reset generic counters CNTx	User	Resets generic counters CNTx.
C06	Reset LIMx limits	User	Reset limits LIMx variable status
C07	Reset hours counter line 1/line 2	Advanced	Reset counter of presence / absence of line 1 and line 2 in the respective limits
C08	Reset hours counter brk 1/ brk 2	Advanced	Reset counter opening / closing breakers 1 and 2
C09	Reset breaker operation	Advanced	Reset braker operations counter
C10	Reset events list	Advanced	Resets the list of historical events
C11	Reset default parameters	Advanced	Resets all the parameters in the setup menu to the default values
C12	Save parameters in backup memory	Advanced	Copies the parameters currently set to a backup for restoring in the future
C13	Reload parameters from backup memory	Advanced	Transfers the parameters saved in the backup memory to the active settings memory
C14	Forced I/O	Advanced	Enables test mode so you can manually energize any output. *Warning! In this mode the installer alone is responsible for the output commands*

C15	Reset A03 – A04 alarms	Advanced	Restores the opening and closing command of the commutation devices after generating alarms A03 – A04
C16	Simulate line failure	Advanced	The device moves to AUT mode and simulates the lack of the priority line for one minute. It then switches the load with the automatic procedure as programmed

- Once the required command has been selected, press ✓to execute it. The device will prompt for a confirmation. Pressing ✓again, the command will be executed.
- To cancel the command execution press **RESET**.
- To quit command menu press **RESET**.

Installation

- ATL600 is designed for flush-mount installation. With proper mounting, it guarantees with the optional gasket IP65 front protection.
- Insert the device into the panel hole, making sure that the gasket, if available, is properly positioned between the panel and the device front frame.
- Make sure the tongue of the custom label doesn't get trapped under the gasket and break the seal. It should be positioned inside the board.
- From inside the panel, for each four of the fixing clips, position the clip in its square hole on the housing side, then move it backwards in order to position the hook.

- Repeat the same operation for the four clips.
- Tighten the fixing screw with a maximum torque of 0,5Nm.
- In case it is necessary to dismount the system, repeat the steps in opposite order.
- For the electrical connection see the wiring diagrams in the dedicated chapter and the requirements reported in the technical characteristics table.
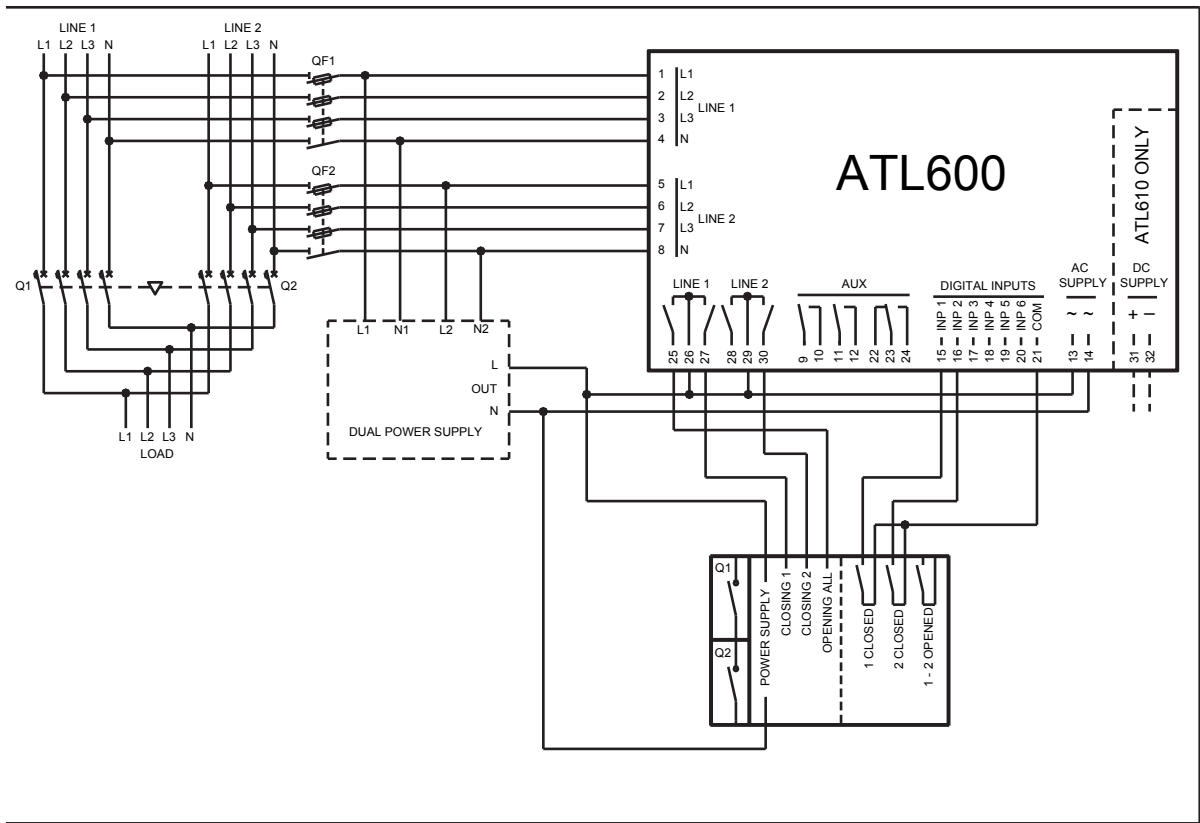
Control of motorised circuit breakers
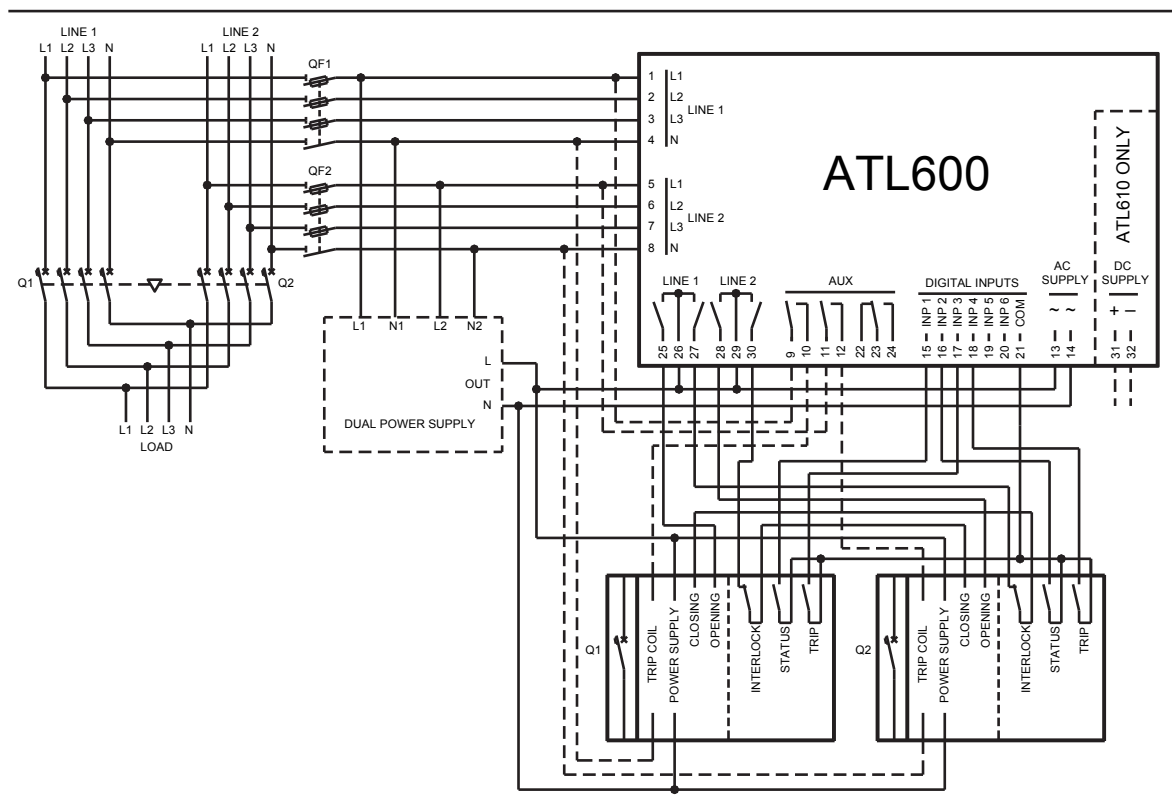
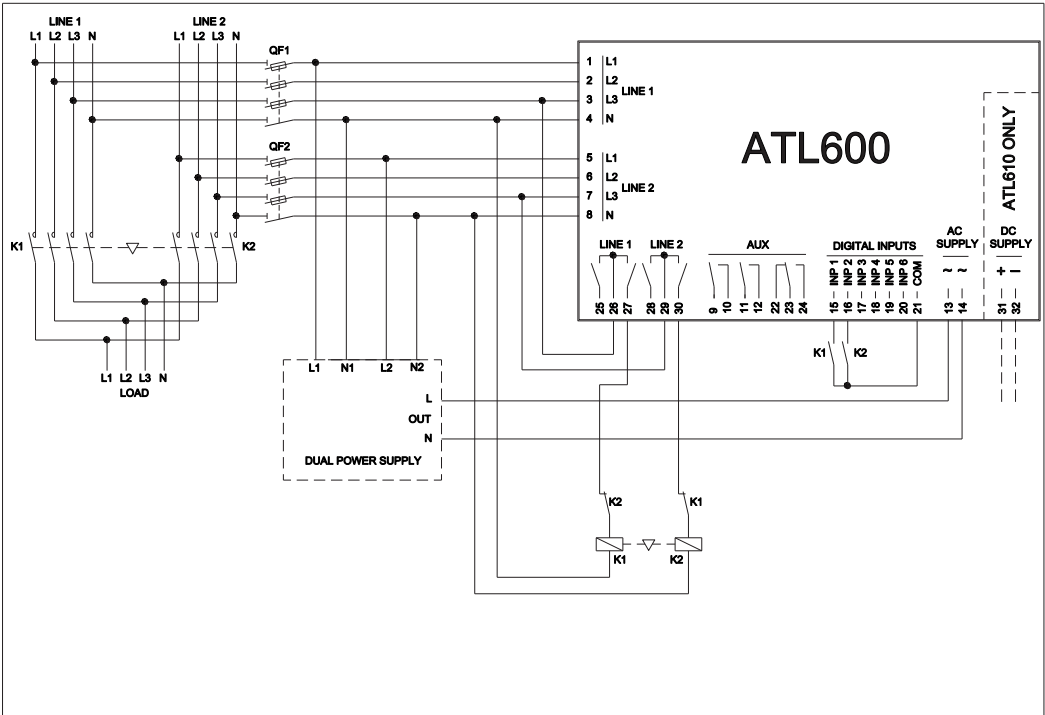**Parameter setting for the wiring diagram in picture**

Terminal	Parameter code	Setting
---	P05.07	Breaker pulse or breaker continuous
15(INP1)	P10.01.01	Line 1 breaker closed (Feedback 1)
16(INP2)	P10.02.01	Line 2 breaker closed (Feedback 2)
17(INP3)	P10.03.01	Line 1 circuit breaker protection (Trip 1)
18(INP4)	P10.04.01	Line 2 circuit breaker protection (Trip 2)
25(OUT4)	P11.04.01	Open line 1 contactor/circuit breaker
27(OUT5)	P11.05.01	Close line 1 contactor/circuit breaker
28(OUT6)	P11.06.01	Open line 2 contactor/circuit breaker
30(OUT7)	P11.07.01	Close line 2 contactor/circuit breaker

Control of motorized changeover switch

Parameter setting for the wiring diagram in picture

Terminal	Parameter code	Setting
---	P05.07	Changeover pulse or Changeover continuous
15(INP1)	P10.01.01	Line 1 breaker closed (Feedback 1)
16(INP2)	P10.02.01	Line 2 breaker closed (Feedback 2)
25(OUT4)	P11.04.01	Open line 1 / line 2
27(OUT5)	P11.05.01	Close line 1 contactor/circuit breaker
30(OUT7)	P11.07.01	Close line 2 contactor/circuit breaker

Control of contactors

Parameter setting for the wiring diagram in picture

| Terminal	Parameter code	Setting
---	P05.07	Contactors
15(INP1)	P10.01.01	Line 1 breaker closed (Feedback 1)
16(INP2)	P10.02.01	Line 2 breaker closed (Feedback 2)
27(OUT5)	P11.05.01	Close line 1 contactor/circuit breaker
30(OUT7)	P11.07.01	Close line 2 contactor/circuit breaker

Dual power supply implementation with auxiliary voltage control by Lovato Electric dual power supply relay code ATLDPS1
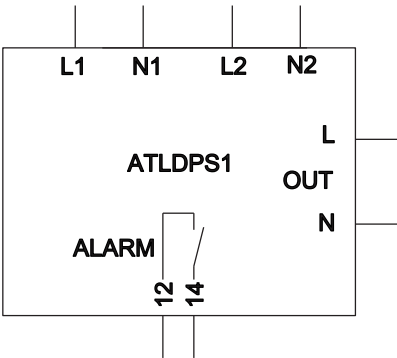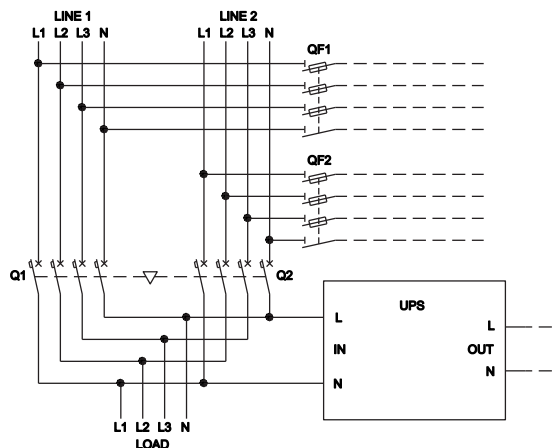

Dual Power Supply implementation with auxiliary voltage control by voltage monitoring relay
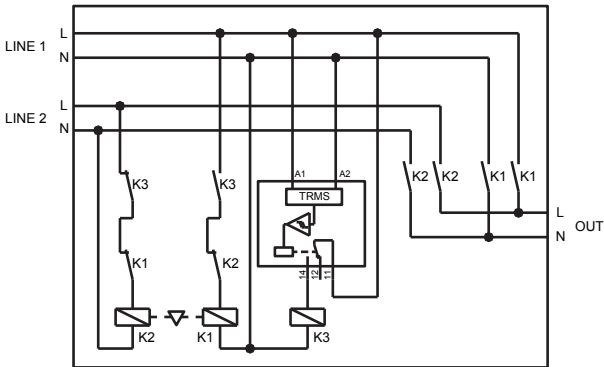
Dual Power Supply implementation with auxiliary supply selection by electromechanical relays (don't use in gen-set applications)
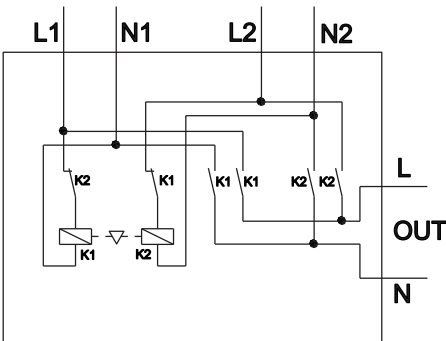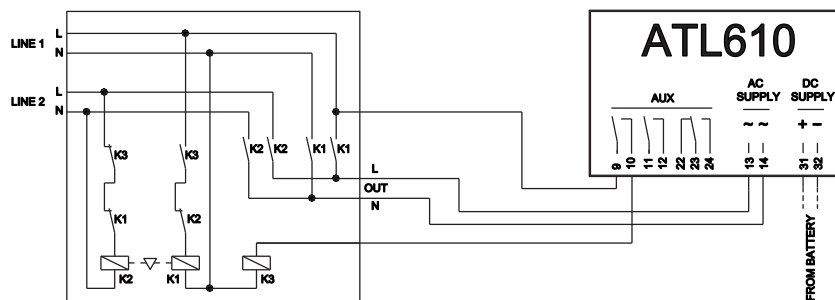
Auxiliary power supply from UPS

Execution recommended for Gen-set applications
Line 2 coming from generator

Auxiliary voltage control by ATL610 + optional AC Dual Power Supply (battery supply available)

Note:
- The output on terminals 9 - 10 (OUT 1) (parameter P11.01.01) must be set with function *Line 1 status*.
- Set output generator control 2 so that when ATL610 is not powered, gen-set must start.

Execution recommended for Gen-set applications
Line 2 coming from generator

Auxiliary voltage control by ATL600 + optional AC Dual Power Supply (battery supply not available)
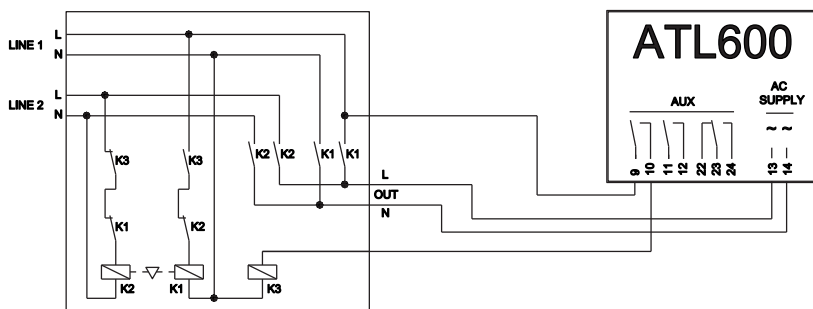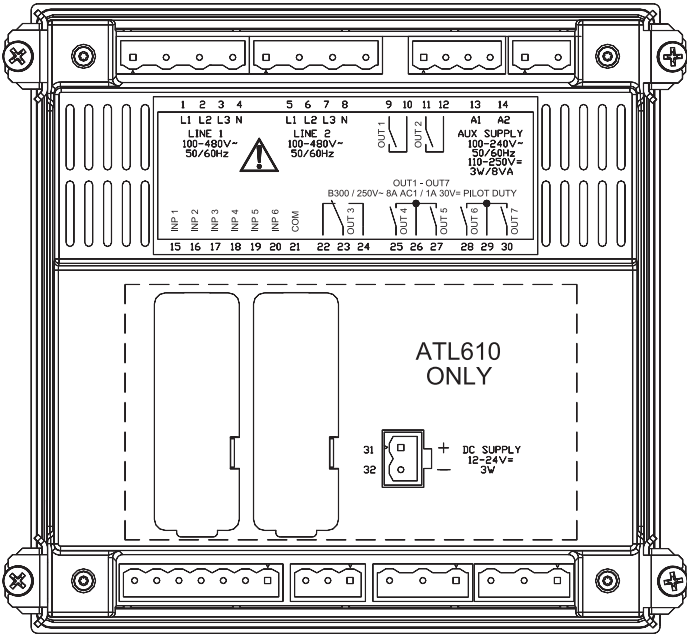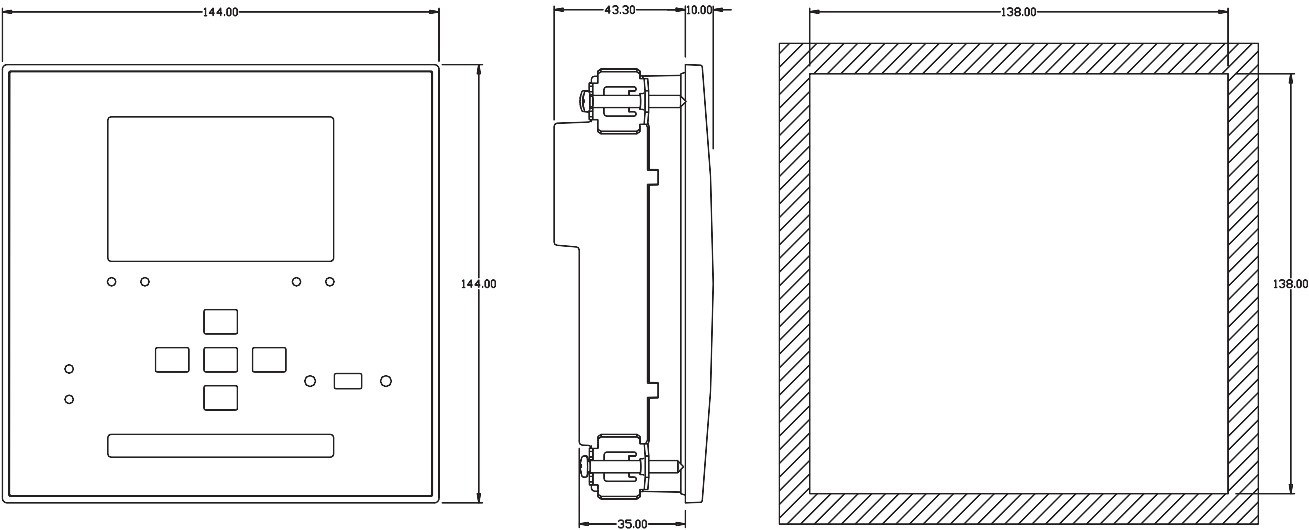

Note:
- The output on terminals 9 - 10 (OUT 1) (parameter P11.01.01) must be set with function *Line 1 status*.
- Set output generator control 2 so that when ATL610 is not powered, gen-set must start.

Terminals position

Mechanical dimensions and front panel cut-out (mm)

Technical characteristics

AC Supply : terminals 13, 14	
Rated voltage Us	100 - 240V~ 110 - 250V=
Operating voltage range	90 - 264V~ 93.5 - 300V=
Frequency	45 - 66Hz
Power consumption/dissipation	3,8W – 9,5VA
Immunity time for microbreakings	≤50ms (110V~) ≤250ms (220V~)
	≤25ms (110V~) ≤120ms (220V~)
Recommended fuses	F1A (fast)

DC supply: terminals 31, 32 (ATL610 only)	
Battery rated voltage	12 or 24V= indifferently
Operating voltage range	7.5…33V=
Maximum current consumption	230mA at 12V= e 120mA at 24V=
Maximum power consumption/dissipation	2,9W

Line 1 and Line 2 voltage inputs: terminals 1-4 and 5-8	
Maximum rated voltage Ue	480V~ L-L (277VAC L-N)
Measuring range	50-576V~ L-L (333V~ L-N)
Frequency range	45-65Hz
Measuring method	True RMS
Measuring input impedance	> 0.5MΩ L-N > 1,0MΩ L-L
Wiring mode	Single-phase, two-phase, three-phase with or without neutral or balanced three-phase system.

Measuring accuracy	
Mains and generator voltage	±0.25% f.s. ±1digit

Real time clock	
Energy storage	Back-up capacitors
Operating time without supply voltage	About 5 minites

Digital inputs: terminals 15 - 20	
Input type	Negative
Current input	≤8mA
Input "low" voltage	≤2,2
Input "high" voltage	≥3,4
Input delay	≥50ms

OUT1 and OUT 2 outputs: terminals 9,10 e 11,12	
Contact type	2 x 1 NO
Rated current	AC1 - 8A 250V~ DC1 - 8A 30V= AC15 -1.5A 250V~
UL Rating	B300 30V= 1A Pilot Duty
Max rated voltage	300V~
Mechanical / electrical endurance	1×10^7 / 1×10^5 ops

OUT3 output: terminals 22, 23, 24	
Contact type	1 changeover
Rated current	AC1 - 8A 250V~ DC1 - 8A 30V= AC15 -1.5A 250V~
UL Rating	B300 30V= 1A Pilot Duty
Max rated voltage	300V~
Mechanical / electrical endurance	1×10^7 / 1×10^5 ops

OUT4 and OUT 5 outputs: terminals 25,26,27	
Contact type	2 x 1 NO + contact common
Rated current	AC1 - 8A 250V~ DC1 - 8A 30V= AC15 -1.5A 250V~
UL Rating	B300 30V= 1A Pilot Duty
Max rated voltage	300V~
Mechanical / electrical endurance	1×10^7 / 1×10^5 ops
Maximum current at contact common	10A

OUT6 and OUT 7 outputs: terminals 28,29,30	
Contact type	2 x 1 NO + contact common
Rated current	AC1 - 8A 250V~ DC1 - 8A 30V= AC15 -1.5A 250V~
UL Rating	B300 30V= 1A Pilot Duty
Max rated voltage	300V~
Mechanical / electrical endurance	1×10^7 / 1×10^5 ops
Maximum current at contact common	10A

Insulation voltage		
AC Supply		
Rated insulation voltage	Ui 250V~	
Rated impulse withstand voltage	Uimp 7.3kV	
Power frequency withstand voltage	3kV	
Line 1 and Line 2 voltage inputs		
Rated insulation voltage	Ui 480V~	
Rated impulse withstand voltage	Uimp 7.3kV	
Power frequency withstand voltage	3.8kV	
OUT1 and OUT 2 outputs		
Insulation type	Single between OUT1 and OUT 2 Double toward the remaining groups	
Rated insulation voltage	Ui 250V~	
	Single	Double
Rated impulse withstand voltage	Uimp 4.8kV	Uimp 7.3kV
Power frequency withstand voltage	1.5kV	3kV
OUT 3 output		
Rated insulation voltage	Ui 250V~	
Rated impulse withstand voltage	Uimp 7.3kV	
Power frequency withstand voltage	3kV	
OUT4-5 and OUT 6-7 outputs		
Insulation type	Single between OUT4-5 and OUT 6-7 Double toward the remaining groups	
Rated insulation voltage	Ui 250V~	
	Single	Double
Rated impulse withstand voltage	Uimp 4.8kV	Uimp 7.3kV
Power frequency withstand voltage	1.5kV	3kV

Ambient operating conditions	
Operating temperature	-30 - +70°C
Storage temperature	-30 - +80°C
Relative humidity	<80% (IEC/EN 60068-2-78)
Maximum pollution degree	2
Overvoltage category	3
Measurement category	III
Climatic sequence	Z/ABDM (IEC/EN 60068-2-61)
Shock resistance	15g (IEC/EN 60068-2-27)
Vibration resistance	0.7g (IEC/EN 60068-2-6)

Connections	
Terminal type	Plug-in / removable
Cable cross section (min… max)	0.2-2.5 mm² (24…12 AWG)
UL Rating Cable cross section (min… max)	0,75-2.5 mm² (18…12 AWG)
Tightening torque	0.56 Nm (5 lbin)

Housing	
Version	Flush mount
Material	Polycarbonate
Degree of protection	IP40 on front IP65 with optional gasket IP20 terminals
Weight	680g

Certifications and compliance	
cULus	Pending
Reference standards	IEC/EN 61010-1, IEC/EN 61000-6-2 IEC/ EN 61000-6-3 UL508 and CSA C22.2-N°14
UL Marking	Use 60°C/75°C copper (CU) conductor only AWG Range: 18 - 12 AWG stranded or solid Field Wiring Terminals Tightening Torque: 4.5lb.in Flat panel mounting on a Type 1 or 4X enclosure

Manual revision history

Rev	Date	Notes
00	30/07/2014	• First release
01	26/09/2014	• Schemas updating

MERTECH SWITCHBOARDS LTD
MERTECH HOUSE
39-49 HASTINGS STREET
LUTON, BEDS. LU1 5BE
TEL: 01582 422622