**ИБП APC MGE Galaxy 4000 - руководство по эксплуатации. Юниджет**

Постоянная ссылка на страницу: https://www.uni-jet.com/catalog/ibp/on-line-ibp/apc-mge-galaxy-4000/

# MGE Galaxy 4000

# 40–75 kVA 208V

## Operation

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# About This Manual

This manual describes the operator display panel, interface screens, keys and mimic diagram. The manual provides startup, shutdown, and normal operation of the MGE Galaxy 4000 UPS. Included are pre and post startup safety checklists. The manual also describes maintenance and safety information on servicing batteries for the MGE Galaxy 4000.

## Companion Manuals

For additional information about the MGE Galaxy 4000, see the following documents:

- MGE Galaxy 4000 Installation — 990–3964–001

## Find Updates to this Manual

You can check for updates to this manual on www.apc.com. Look for the latest letter revision (A, B etc.) of the manual.

# Overview

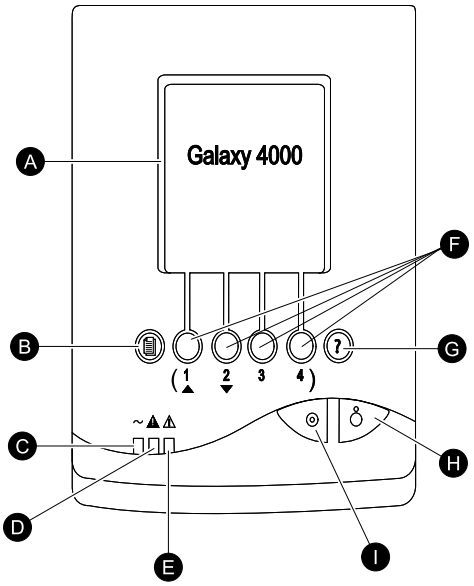
## Operator Interface Keys and Indicators

The operator interface screens contained on the MGE Galaxy 4000 display panel provide an easy to use method to access and control the MGE Galaxy 4000 features.

The Soft Keys are programmed to allow you to scroll up and down through the list of alarms (soft keys #1 and #2). Soft key #3 allows you to delete a specific alarm message. Soft key #4 allows you to examine in further detail a specific alarm message. Although slightly different in operation, the detail key (soft key #4) must be held down to examine the message details.

The four dedicated purpose keys are the main menu, online help, ON (green), and OFF (gray) buttons. For inverter OFF a confirmation will always be requested.

| | |
|---|---|
| A | Color Display (Screen Saver shown) |
| B | Main Menu key |
| C | Load Protected (green) LED indicator |
| D | Minor Fault (orange) LED indicator |
| E | Major Fault (red) LED indicator |
| F | Soft Keys<br>1 = Scroll up<br>2 = Scroll down<br>3 = View Alarm messages<br>4 = Detail of Alarm message |
| G | Online Help key |
| H | Inverter Off button |
| I | Inverter On button |




### LED Indicator Functions

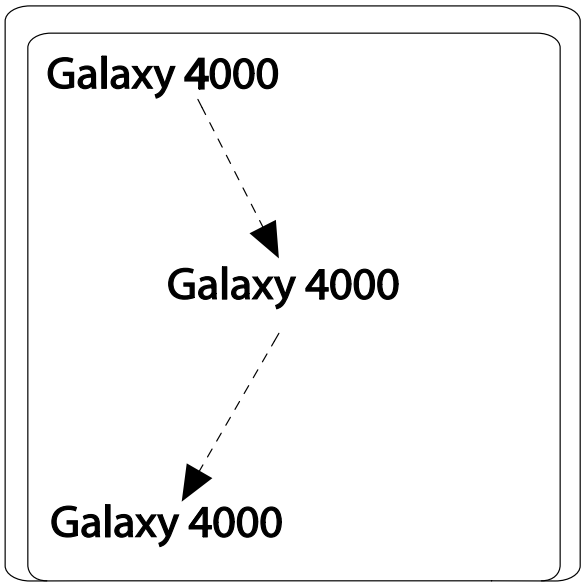
The three LED indicators (see ***"Operator Interface Keys and Indicators"*** ) provide the following information:

| **Green LED** | | **Orange LED** | | **Red LED** | |
|---|---|---|---|---|---|
| **ON** | Load on UPS | **ON** | Minor fault such as: | **ON** | Major fault such as: |
| **Flashing** | Load is on battery power | | Loss of AC input power | | Internal fault |
| **OFF** | Inverter not connected to the load | | Battery problem | | Rectifier fault |
| | | | Overload | | Inverter fault |
| | | | Load on bypass | | Bypass static switch fault |
| | | | | | Battery not connected |

**Caution:** When the Red LED is ON, the load is not protected.

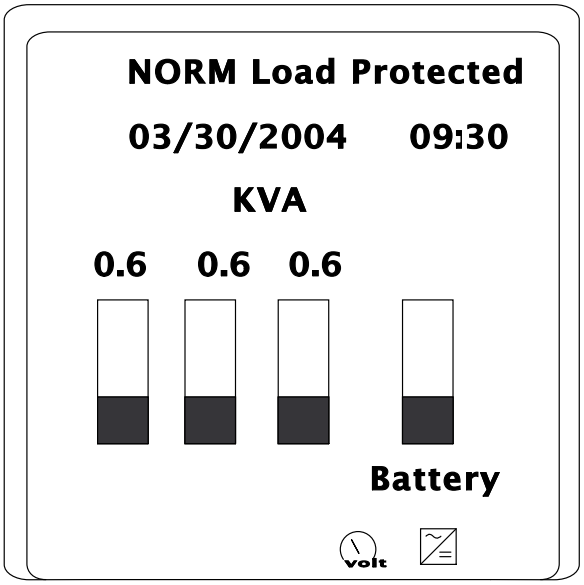
## Screen Saver

When the MGE Galaxy 4000 system has been in continuous operation, the operator interface will present a screen saver display. The product name, "Galaxy 4000", will be moving around the screen to provide an indication that the unit is functional.




## Operational Summary Screen

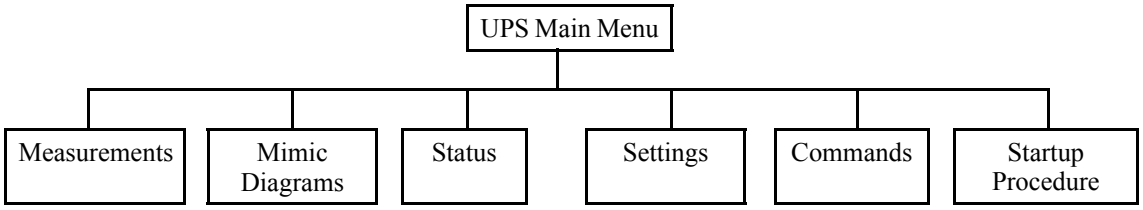
Pressing any of the keys will cause the unit to provide an operational summary display with the following information. This display will quickly show the operator the time/date, the KVA load on all three phases, as well as the battery level.



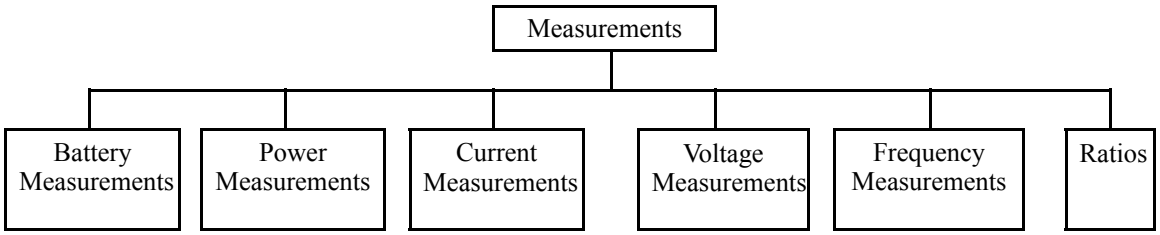
# Display Menu Structure

This display menu structure is provided below for the MGE Galaxy 4000 system

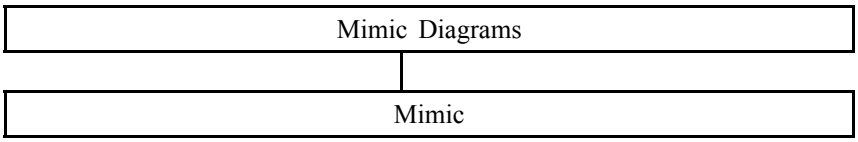
## UPS Main Menu



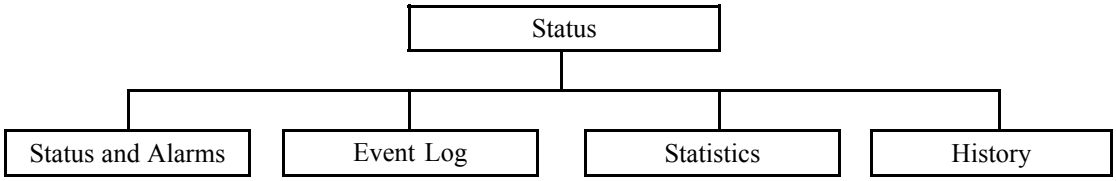

## Measurements



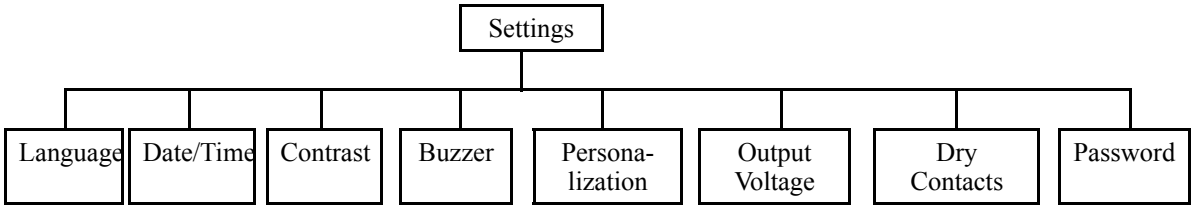

## Mimic Diagrams



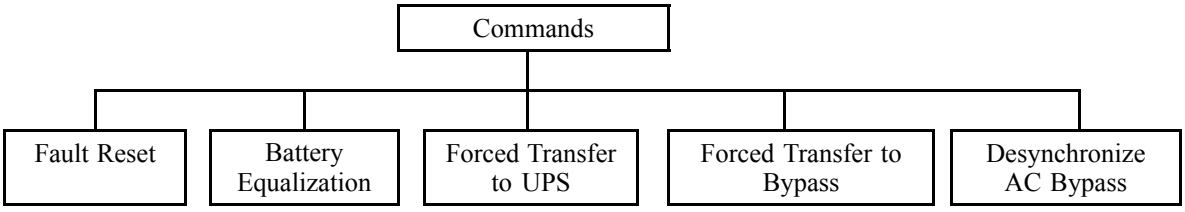

## Status



## Settings

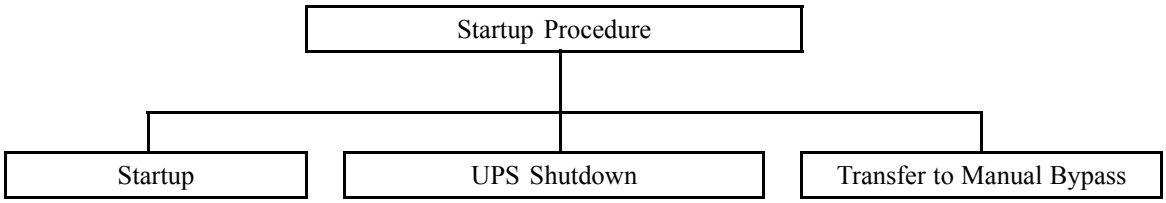



## Commands



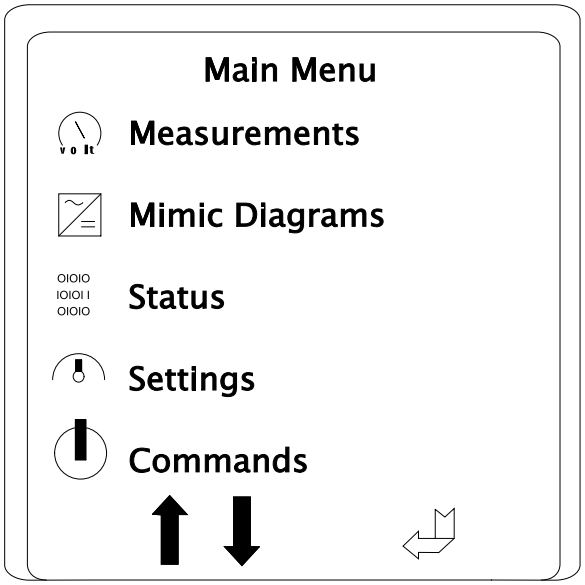

**Note:** The expanded Commands menu can be found in the section ***"User Configuration —> Commands Screen"***

## Startup Procedure



# Main Menu Screen

The Main Menu screen allows the operator to access many displays to monitor the operating performance of MGE Galaxy 4000, obtain alarm information, change operational settings as well as issue software based commands. The Main Menu conveniently displays groups of items according to function. By using one of the first two soft keys the selection cursor may be moved up and down until the desired display group is selected. Then by pressing the fourth soft key, the selected display (or display group) will be summoned.

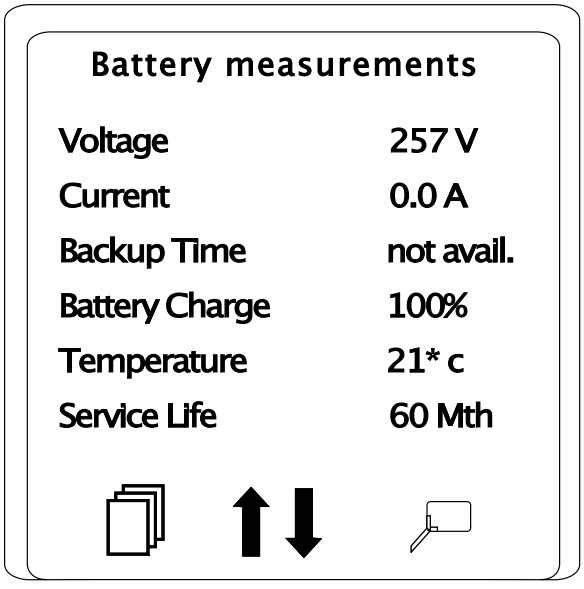



# Measurements

Selecting the Measurements option from the main menu provides the following screen selections: battery, power, current, voltage, frequency measurements, and ratios.

## Battery Measurements Screen

The Battery Measurements screen provides a rapid assessment of the available battery voltage, current, battery charge, temperature as well as expected service life.




The backup time measurement will be calculated if the following battery parameter identification (BPI) requirements are met:

Required Conditions to Initiate BPI:

- BPI set to automatic in personalization
- Battery charge level = 100%
- UPS On-line (Inverter Coupled)
- Mains 2 within tolerance
- Percent load is >15%
- Battery temperature 0–40ºC (32–104ºF)
- No battery faults
- No rectifier or inverter overload condition

If the above conditions are met and maintained then the UPS will run a successful BPI. A normal BPI will drain the batteries to a level of 80% capacity. When the BPI is completed successfully, the backup time will be displayed when the batteries are 100% charged. If the load does not change by more than ±20%, then a BPI will be run again in one year. Another BPI will run only if, the load changes by ±20% or the BPI is a year old.

If one of the conditions below occurs during the performance of the BPI, the BPI will be aborted.

Factors Leading to Abort a BPI:

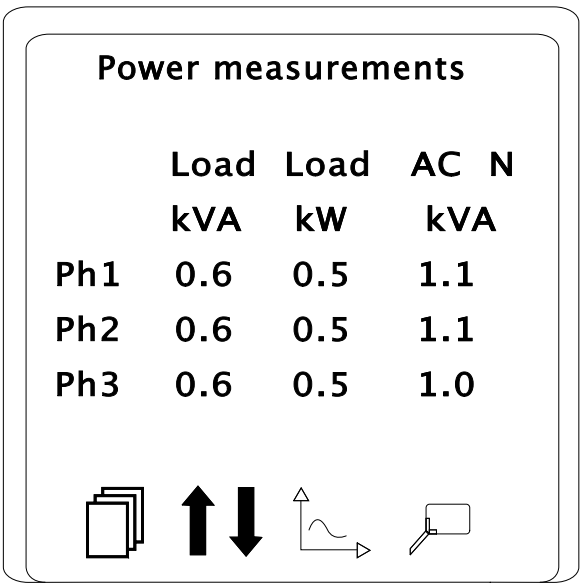
- Inverter to mains 2 source transfer
- Load percent drops to <15%
- Battery temperature outside 0–40ºC (32–104ºF)
- Percent load changes more than +/-5% from starting power level
- Battery temperature does not stay within ±10ºC from the starting temperature point
- Communication fault
- Input current 0 amps or >100% load current
- Rectifier or inverter overload
- Mains 1 or Mains 2 failure

In case the BPI cannot be done, a simplified autonometer will be used. This autonometer will start and display backup time when the batteries are 100% charged. Because the calculation used is more simplified than the one used for calculating backup time using a BPI, these will be less accurate. Therefore it is preferable to use the BPI whenever possible. This provides an option for example, when less than 15% load or cannot run a BPI.

**Note:** Any of the displayed items can be examined further by using the soft key with the double arrows to select the item of interest and then pressing the soft key with the magnifying glass.

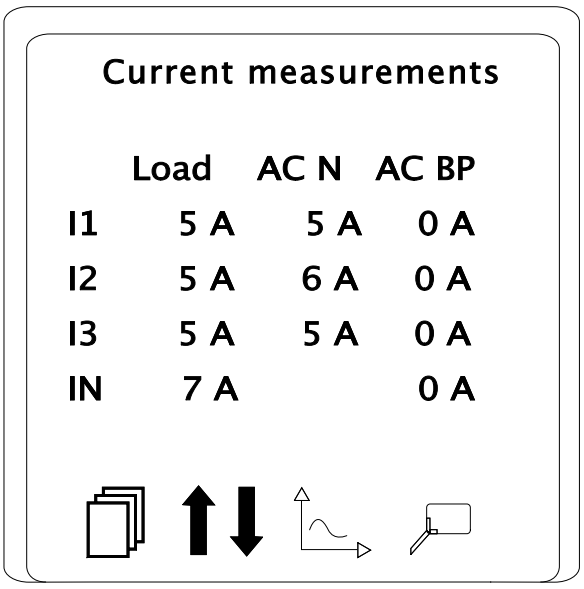
## Power Measurements Screen

The **Power Measurements screen** screen displays the load power on each phase in KVA and in KW. Additionally, the AC "normal" (AC N) source is shown with the KVA.



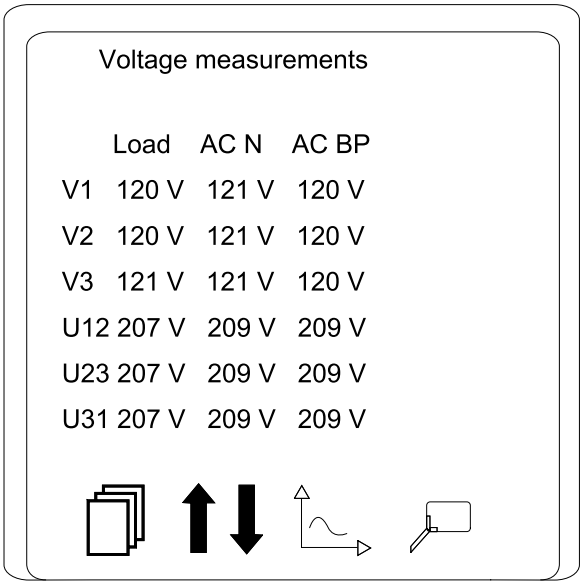

## Current Measurements Screen

The **Current Measurements** screen displays the current on the load, AC “normal” (AC N), and AC “bypass” (AC BP) on each of the three phases and neutral.



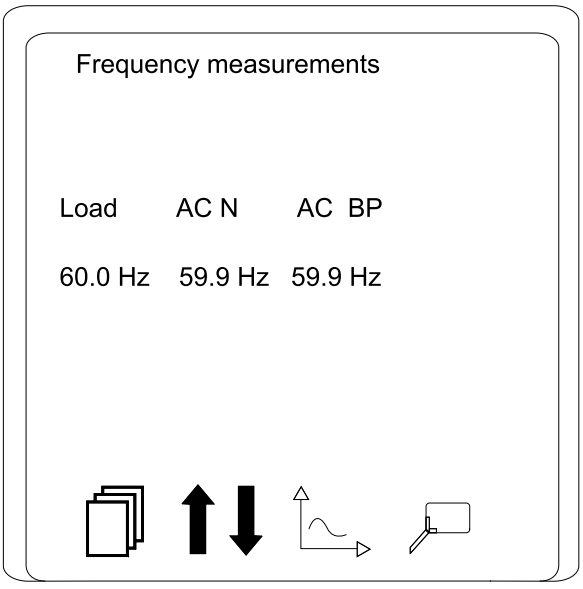
## Voltage Measurements Screen

The **Voltage Measurements** screen displays the voltage presently on any one of the input phases (AC N and AC BP) and each phase of the load, as well as the differential voltage as measured between any two phases of the inputs and the load.



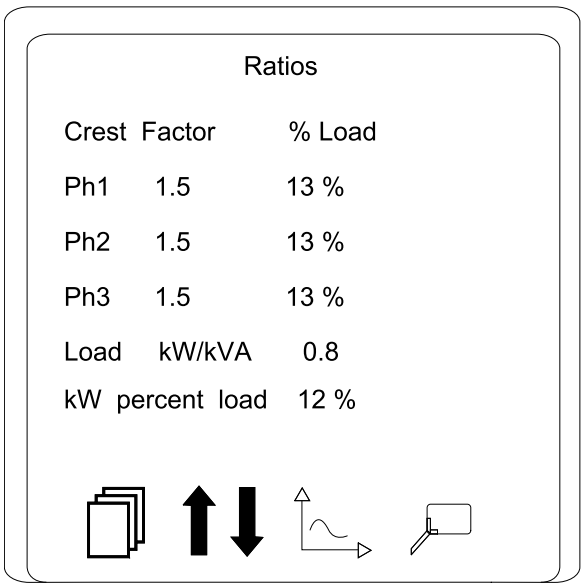

## Frequency Measurements Screen

The **Frequency Measurements** screen displays the frequency presently on any one of the input lines (AC N and AC BP) and the load.



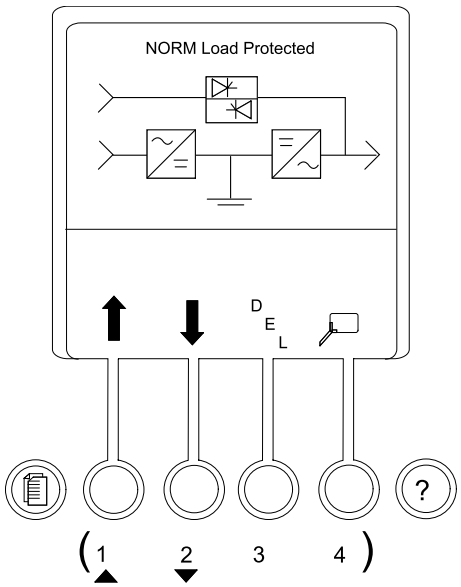
## Ratios Screen

The **Ratios** screen displays the crest factor for each phase, the present percentage of load for each phase and for the total unit. Additionally, the load in KVA/KW is provided.




# Mimic Diagrams

The **Mimic Diagrams** screen is unlike any of the other screens we have examined. This screen is actually two screens in one. The top half of the screen contains a single line representation of the current operating condition of the MGE Galaxy 4000 unit. Through the use of color changes in the screen, it will indicate whether the unit is operating normally, is on bypass, or is currently running on batteries. Segments are green when the function is active, orange when not active, and red when a fault has occurred.




The lower half of the screen will show any existing alarm conditions.

**Soft Keys**

| | |
|---|---|
| 1 & 2 | Soft keys are now programmed to allow the user to scroll up and down through the list. |
| 3 | To delete a specific alarm message. |
| 4 | To further examine a specific alarm message. |

The detail key (#4) must be held down to examine the message details. To exit this display, it is necessary to press the **Main Menu** key.

# Status Screen

Selecting the **Status** option from the **Main Menu** provides the following screen selections: Status and Alarms, Event log, Statistics, and History.

**Status and Alarms**
Provides the user with the present list of alarms and warnings

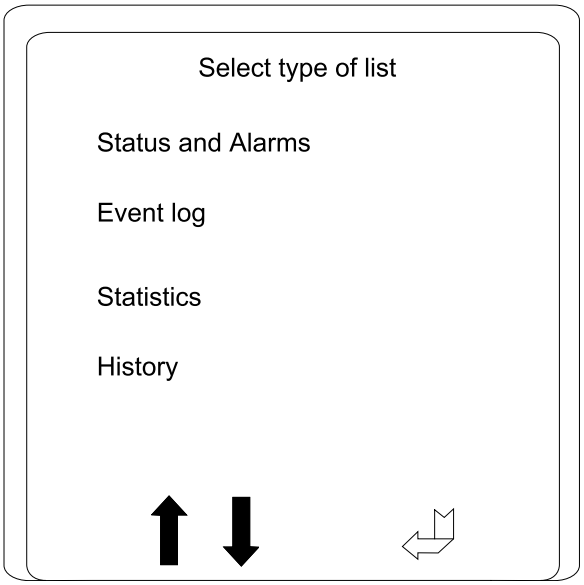
**Event Log**
Provides the user with the history of events with date and time stamp

**Statistics**
Provides total time:

- on battery power
- on AC Bypass (AC BP)
- on UPS (AC N or battery)
- with battery temperature (TBatt) >25ºC

**History**
Provides history after 60 days for:

- battery capacity
- backup time
- % of load



# Operation

The MGE Galaxy 4000 system is simple to operate and yet provides a wealth of continuous monitoring and diagnostic features to ensure the proper operation. Operators gain access to information in the MGE Galaxy 4000 system through the display panel. See ***"Overview"*** for operation of the display panel.

## Important Safety Instructions

This manual contains important instructions for MGE Galaxy 4000 that must be followed during operation and maintenance of the equipment.

**WARNING: Opening enclosures expose hazardous voltages. Always refer service to qualified personnel only.**

**WARNING: As standards, specifications, and designs are subject to change, please ask for confirmation of the information given in this publication.**

**Note:** This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at user's own expense.

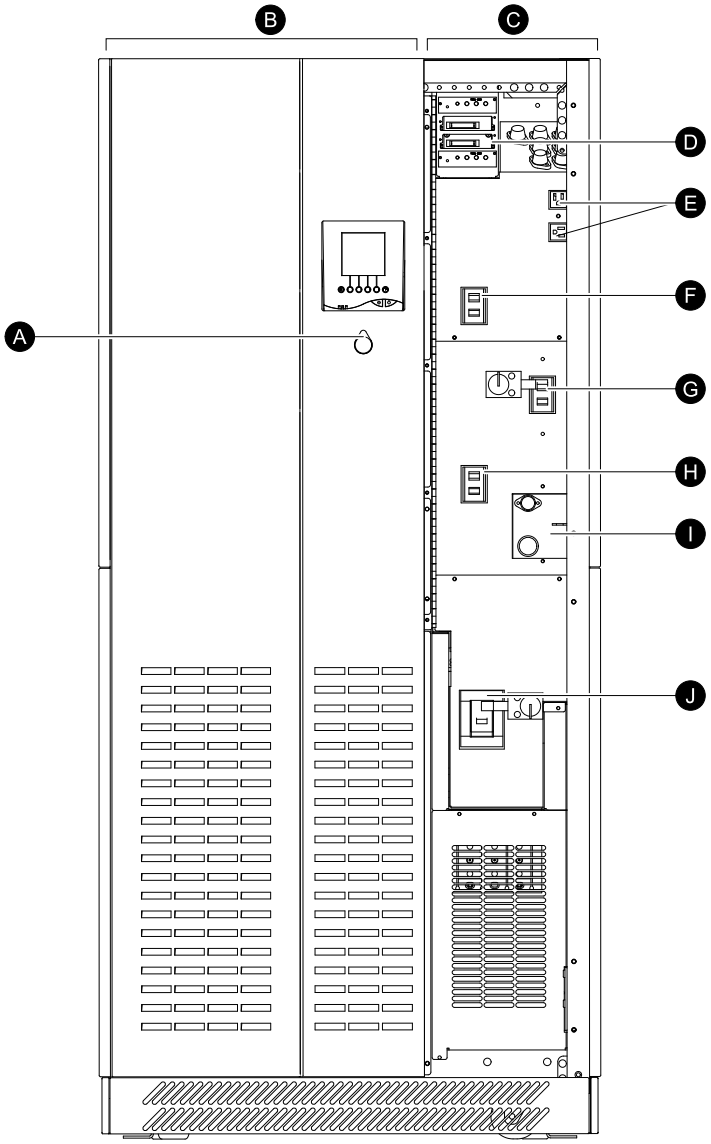
**WARNING: To reduce the risk of fire or electric shock, install in a controlled indoor environment free of conductive contaminants. This equipment is intended only for installations in a RESTRICTED ACCESS LOCATION.**

**WARNING: HIGH LEAKAGE CURRENT. Earth connection essential before connecting supply.**

# Preparing for Startup

Before being able to use the display panel to monitor and control your MGE Galaxy 4000 system, a number of items should be verified to insure that all conditions will provide for safe operation. The following check lists are provided to aid in the successful pre and post startup of the MGE Galaxy 4000. They include items to verify prior to applying power, and then tests that should be performed (when appropriate) after startup to verify the health and functionality of all critical modules within the system.

Before starting the MGE Galaxy 4000, read this manual thoroughly. Be certain that you fully understand the operation of the indicators, controls, and operational sequences. APC by Schneider Electric offers professional startup services in most countries. It is strongly suggested that before applying power to your MGE Galaxy 4000, you contact your APC certified Service partner to properly commission your system.




| | | | |
|---|---|---|---|
| A | Emergency Power off | F | **Q1** Input Switch |
| B | Qualified Technician Access Only | G | **Q3BP** Maintenance Bypass Switch (optional) |
| C | Customer Access | H | **Q4S** Bypass Switch |
| D | Communication Card Ports | I | Electrical Interlock (optional) |
| E | Accessories Outlets | J | **Q5N** Output Circuit Breaker |

## Pre-Startup Safety Check List

1. Ensure all power and control wires have been properly connected and securely tightened.
2. Check to see that the upstream and downstream protective devices are not tripped, and have been sized properly for the UPS and load requirements.
3. Check that the input voltage is the same as indicated on the UPS nameplate, located inside the door of the MGE Galaxy 4000 UPS.
4. Make certain that nothing is blocking the air intake underneath and around the front bottom of the UPS and that the air exhaust on the top of the UPS is free of all obstructions.
5. If present, check to see that the external optional maintenance bypass circuit breakers CB1, CB2, and CB3 (optional breaker) are in the OFF (open) position.
6. Check to see that the battery disconnect circuit breaker(s) QF1 (in battery cabinet) is in the OFF (open) position.
7. Check to see that the cabinet is resting on its lifting leveler jacks and are not on the 4 casters.
8. Check that the load-circuit breakers (where applicable) are in the OFF position.

# Normal Startup Procedure

With all of the initial safety check lists verified, the MGE Galaxy 4000 UPS system can now be powered. The following startup procedure should be performed during the initial startup following installation and commissioning of the system (typically by an APC certified Service partner), and this sequence should be followed any time that the MGE Galaxy 4000 UPS is being restarted from an off condition (i.e. after the UPS has been powered down by removing the upstream AC input power and opening all the circuit breakers of the UPS). For device locations refer to ***"Preparing for Startup"***

1. Apply power to the UPS bypass by closing the upstream circuit breaker supplying Q4S (mains 2).
2. Apply power to the UPS input by closing the upstream circuit breaker supplying the main AC input Q1 (mains 1).
3. Close the maintenance bypass switch Q3BP in the UPS cabinet or in an external cabinet if present. Power is now available at the UPS output (the load is energized) via maintenance bypass.
4. Close the bypass switch Q4S. The static switch will come on-line; the fans will start and the display will illuminate.
5. Close the output isolation circuit breaker Q5N.
6. Open the maintenance bypass switch Q3BP in the UPS cabinet or in an external cabinet if present. The load is now supplied via the static switch.

**Note:** If your UPS configuration does not include the maintenance bypass option, startup requires only closing Q4S and Q5N to supply the bypass source to the attached load.

**Caution:** If the UPS is programmed for automatic restart the inverter will automatically start.

7. Close the input switch Q1. Verify that the following conditions exist:
   — The red "load not protected" LED is on.
   — The rectifier automatically starts.

   If either condition is not present, there is a fault. Open Q1 and contact APC.
8. Close the battery disconnect circuit breakers QF1. The batteries are now connected to the battery charger, and have begun charging.
9. If the UPS is programmed for manual restart, press the "inverter on" green pushbutton.
10. The UPS will automatically transfer the load to the UPS inverter output. The green "load protected" LED will turn on and remain on.
11. Close the optional output distribution circuit breakers (if present).

**Note:** If the transfer conditions are not satisfied (bypass AC input source is out of tolerance, or some other reason), a forced transfer is required.

# Post Startup Safety Check List

After initial startup of the system, normal operation should be tested. At the minimum, the following tests should be performed as applicable to your installation.

- Emergency Power Off (EPO) test.
- Remote Emergency Power Off (REPO) test (if applicable).
- Inverter start and stop.
- Battery transfer test.
- Maintenance bypass procedure.

**Caution:** As soon as AC input power is supplied to the MGE Galaxy 4000 (customer supplied upstream circuit breaker is in the "ON" position), the load is initially supplied via the "Static Switch". Verify that no error indications are present on the operator interface display panel.

# Shutdown Procedure

Proceed as follows:

1. Press the gray, Inverter OFF button.
2. Confirm by pressing the function key.
   The load is no longer protected by the UPS. It is supplied via the bypass.
3. Set the battery circuit breakers QF1 (in battery cabinet) to the OFF position.
4. Close Q3BP, open input switch Q1, bypass switch Q4S, and output breaker Q5N.
5. To completely remove power from the UPS, open Q3BP and open the upstream circuit breakers supplying AC power to switches Q1 and Q4S. Attention: There is no power to the load.

# Shutdown Using EPO

During an emergency situation the UPS and all downstream devices can be instantly shutdown by pressing the red emergency power off (EPO) pushbutton on the front door of the UPS cabinet, or pressing the remote emergency power off (REPO) pushbutton (if applicable) located within the room.

**Caution:** Pressing the EPO button disconnects the attached load. The emergency power off (EPO) is to be used during emergency situations only, where a hazard to personnel or equipment exists.

# Recovery From EPO

To recover from an emergency power off press the EPO pushbutton again. Follow the normal startup procedure in ***"Normal Startup Procedure"***.

**Note:** The EPO pushbutton is a latching device. The EPO condition will remain until the EPO button is unlatched/released. Press the Fault Reset button 2 to 3 times to clear the logic.

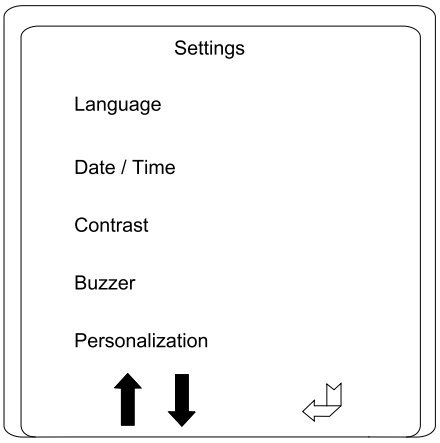
# User Configuration

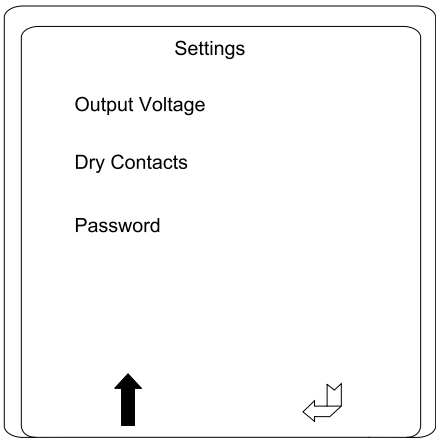
## Settings Screen

The **Settings** screen provides a variety of options for the operation of the MGE Galaxy 4000 system.

The Settings screen provides the following:

| | |
|---|---|
| Language | With an opportunity for the MGE Galaxy 4000 unit to be located in any country, it is possible to select the language of preference from several options. |
| Date/Time | Can be set to insure that the time stamps on the event and alarm logs reflect the current local time and date. |
| Contrast | Allows the contrast of the operator interface unit to be adjusted to maximize its visibility in the current ambient lighting conditions. |
| Buzzer | Allows the volume of the buzzer to be set. |
| Personalization | Allows the operator to select any number of operating parameters for the UPS. |
| Output Voltage | Factory set. Requires a password. |
| Dry Contacts | Factory set. Requires a password. |
| Password | Factory set. Requires a password (factory default 000). |



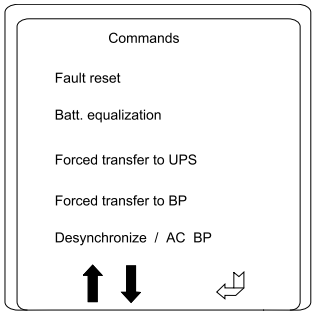

**Caution:** Do NOT adjust any parameters in the personalization section without a clear understanding of the implications to your operation. Should there be any questions about a factory or present setting, please do not hesitate to contact the Customer Support Center.

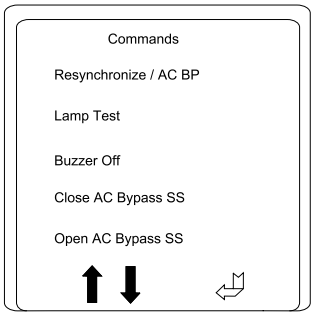
# Commands Screen

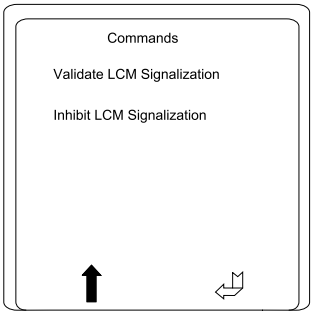
The Commands screen presents options that impact the operation of the UPS system. Extreme care should be exercised when selecting ANY of these menu options.

The Commands screen provides the following:

| | |
|---|---|
| Fault reset | Allows the user to reset a fault condition. |
| Battery equalization | Turns the charger on to the maximum battery voltage. |
| Forced transfer to UPS | Allows transfer to UPS when bypass is not available. |
| Forced transfer to BP (Bypass) | Allows transfer to bypass with 100ms break. Use of this command will drop load. |
| Desynchronize / AC BP | To desynchronize the Inverter from the AC bypass. Transfer inhibit will not allow transfer to and from inverter. |
| Resynchronize / AC BP | To resynchronize the Inverter to the AC bypass. |
| Lamp Test | Allows the user to test the backlight. |
| Buzzer Off | Allows the user to disable the buzzer. |
| Close AC Bypass SS (static switch) | Closes the bypass static switch. Normally closed. |
| Opens AC Bypass SS | Disconnects the bypass source. |
| Validate LCM Signalization | Factory set. Requires password. |
| Inhibit LCM Signalization | Factory set. Requires password. |




# Startup Procedure Screen

The Startup Procedure screen provides the user general information for startup, shutdown and transferring to manual bypass.

# Maintenance

## Servicing Batteries

### IMPORTANT SAFETY INSTRUCTIONS FOR SERVICING BATTERIES

Servicing of batteries should be performed or supervised by personnel knowledgeable of batteries and the required precautions. Keep unauthorized personnel away from batteries.

When replacing batteries, use the same model and manufacturer of batteries.

**Caution:** Do not dispose of battery or batteries in a fire. The battery may explode. Do not open or mutilate the battery or batteries. Released electrolyte is harmful to the skin and eyes. It may be toxic. A battery can present a risk of electrical shock and high short-circuit current.

The following precautions should be observed when working with batteries:

- Remove watches, rings, or other metal objects.
- Use tools with insulated handles.
- Wear rubber gloves and boots.
- Do not lay tools or metal parts on top of batteries.
- Disconnect charging source prior to connecting or disconnecting battery terminals.
- Determine if the battery is inadvertently grounded. If inadvertently grounded, remove the source of ground. Contact with any part of a grounded battery can result in electrical shock. The likelihood of such shock will be reduced if such grounds are removed during installation and maintenance.

# User Parts Replacement

## Determine if you need a Replacement Part

To determine if you need a replacement part, contact APC Customer Support and follow the procedure below so that the APC Customer Support representative can assist you promptly:

1. In the event of a module failure, the display interface will indicate an alarm condition. Scroll through the alarm lists, record the information, and provide it to the representative.
2. Write down the serial number of the unit so that you will have it easily accessible when you contact APC Customer Support.
3. If possible, call APC Customer Support from a telephone that is within reach of the UPS display interface so that you can gather and report additional information to the representative.
4. Be prepared to provide a detailed description of the problem. A representative will help you solve the problem over the telephone, if possible, or will assign a return material authorization (RMA) number to you. If a module is returned to APC, this RMA number must be clearly printed on the outside of the package.
5. If the unit is within the warranty period, repairs or replacements will be performed free of charge. If it is not within the warranty period, there will be a charge.
6. If the unit is covered by an APC service contract, have the contract available to provide information to the representative.

## User Replaceable Parts (Only Trained Personnel)

| **Part** | **APC Part No.** |
|---|---|
| Network Management Card | 66074 |
| JBUS/MODBUS card | 66061 |

## Worldwide Customer Support

Customer support for this or any other product is available at no charge:

- Contact the Customer Support Center by telephone or e-mail. For local, country-specific centers: go to www.apc.com/support/contact for contact information.



990–3963–001 January 2011