



**User Manual**

**LCD Control & Monitor Panel**

*For Type AHF Active Harmonic Filter*

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December 15, 2008



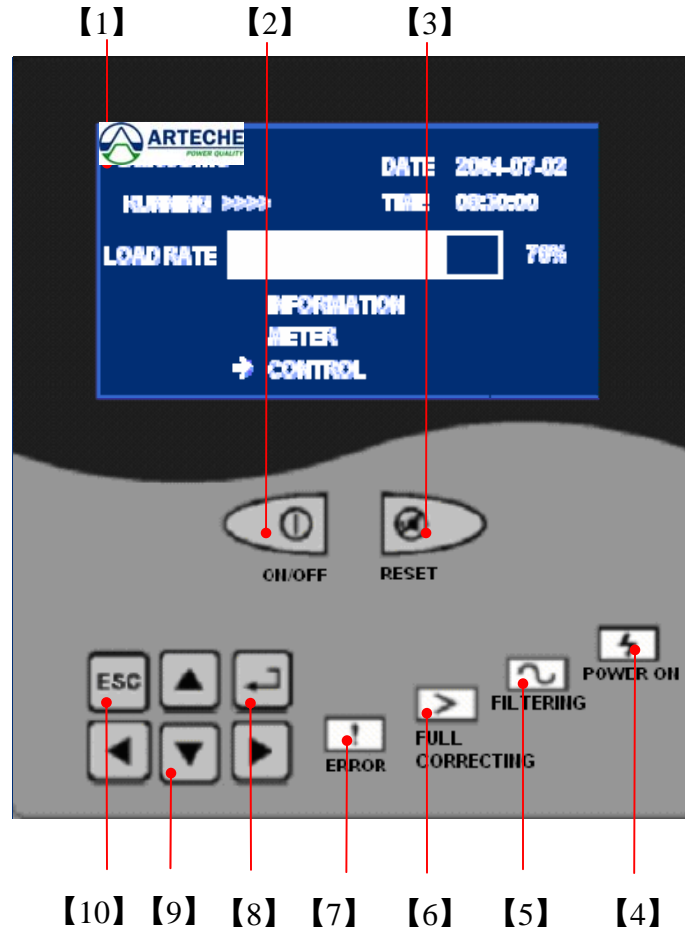
## CONTENTS

|  |          |
|--|----------|
| <b>LCD Control &amp; Display Panel Descriptions .....</b>  | <b>2</b> |
| <b>Operating the Graphic LCD Monitor .....</b>             | <b>4</b> |
| Functional Descriptions .....                              | 4        |
| Functional Flow Chart .....                                | 4        |
| The Descriptions of Key Pads for Graphic LCD Monitor ..... | 5        |
| Main Menu .....  | 6        |
| Meter Menu .....   | 7        |
| Control Menu.....  | 12       |
| Information Menu .....                                     | 21       |

### LCD CONTROL & DISPLAY PANEL DESCRIPTIONS

The Control & Display Panel is made up of 8 Control Keypads, 4 LED indicators and 1 Graphic LCD, which provide the following functions:

- Turning ON/OFF the AHF;
- Clearing error status and silencing audible alarms;
- Display all operating status.



1. Display Screen (Displays of measurements, waveforms, operation & control information)
2. On/Off Keypad
3. Reset ( Alarm Silence) Keypad
4. Power On Indicator
5. Filtering Indicator
6. Full Correcting Indicator
7. Error Indicator
8. Confirmation/Enter Key
9. Directional Scrolling Key
10. Escape/Cancel Key

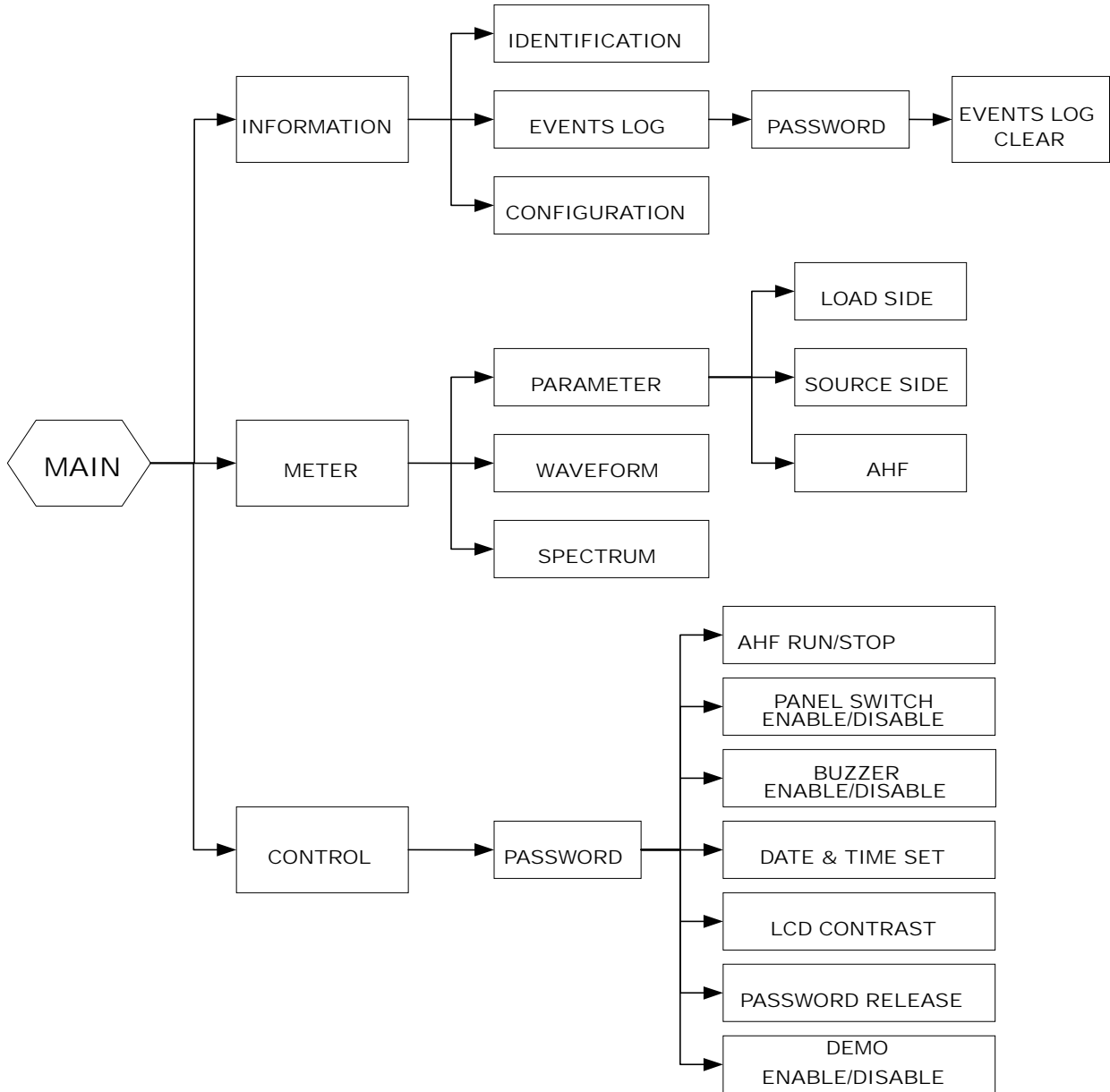
## OPERATING THE GRAPHIC LCD MONITOR

### FUNCTIONAL DESCRIPTIONS

The LCD Monitor provides the user a “Man-Machine” interface with the AHF for operational control, monitoring, and AHF information. The Graphical Display has the following advantages:

- Provides automatic measurements & readings of various parameters, alarm indications and status, allowing user to diagnose the AHF operating conditions more efficiently.
- Provides voltage & current waveform display.
- Provides harmonics measurement & spectrum display.
- Display operating & control procedures and information of major components.
- User-friendly, reduce risk of miss-operation.

**FUNCTIONAL FLOW CHART**



## THE DESCRIPTIONS OF KEY PADS FOR GRAPHIC LCD MONITOR



Directional Scrolling Key, used to scroll the menu and input various parameters.

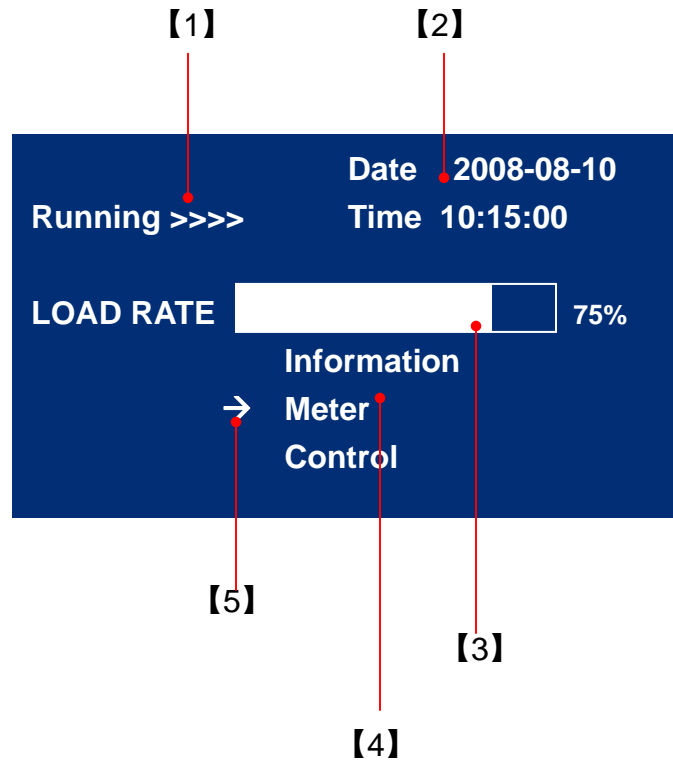


Escape Key, used to return to previous menu or cancel/discard the parameters.



Confirmation/Enter Key, used to go to the next menu and confirm the selection or enter the desire parameters.

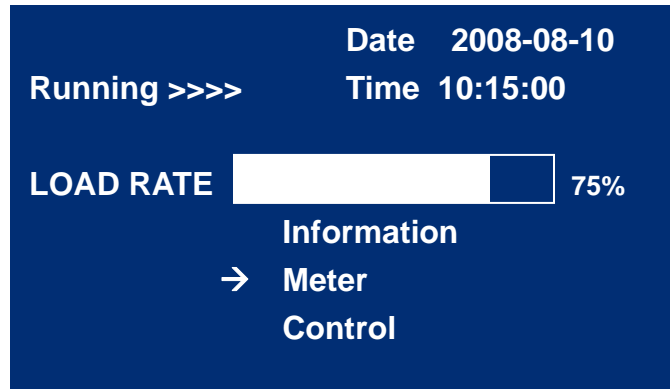
## MAIN MENU



- 【1】** AHF Status:            “**RUNNING >>>>**” AHF is filtering  
                                  “**STOP**”                    AHF is shut-down.
- 【2】** The current date & time
- 【3】** Load Rate Bar Graphic
- 【4】** Main Menu
- 【5】** Cursor: Use the “Up” or “Down” key to move the cursor.

## METER MENU - TO VIEW ELECTRICAL PARAMETERS

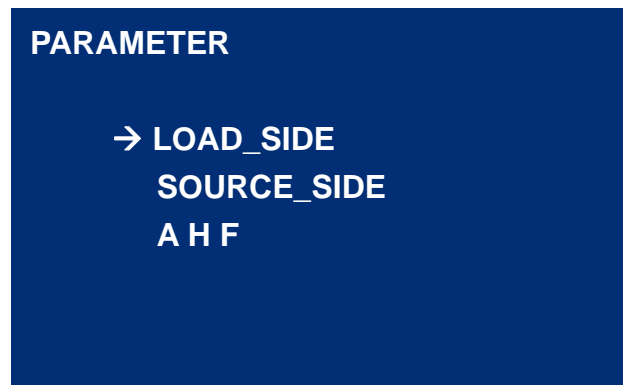
1. Use the “Up” or “Down” key to scroll to “METER”; select by pressing the Confirmation/Enter Key.



2. Once inside the “METER” menu, scroll to “PARAMETER”; select by pressing the Confirmation/Enter Key.



3. To view readings for the Load Side, the Source Side, or the AHF, scroll to the desired directory using the Directional Scrolling Key Pads and select using the Confirmation/Enter Key. All of the various parameter readings will be displayed.



4. Read Load Side measurements.

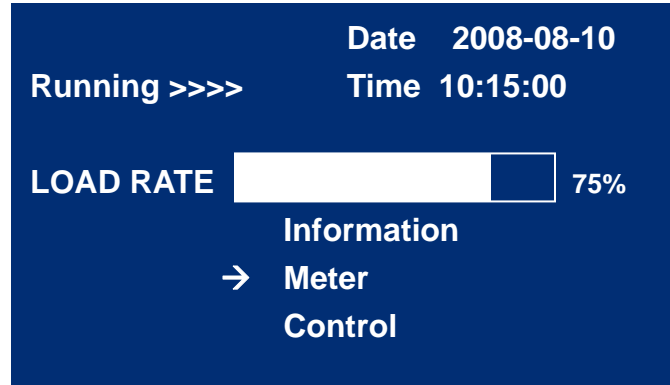
| LOAD_SIDE   |             |             |
|-------------|-------------|-------------|
| KVA = 32.6  | Freq = 60Hz | PF = 0.87   |
| Vab = 480V  | Vbc = 480V  | Bca = 480V  |
| THD = 0.2%  | THD = 0.2%  | THD = 0.2%  |
| Ia = 52.2A  | Ib = 51.9A  | Ic = 52.1A  |
| THD = 18.4% | THD = 19.1% | THD = 18.7% |

KVA : Apparent Power  
Freq: Operating Frequency (Hz)  
PF : Power Factor

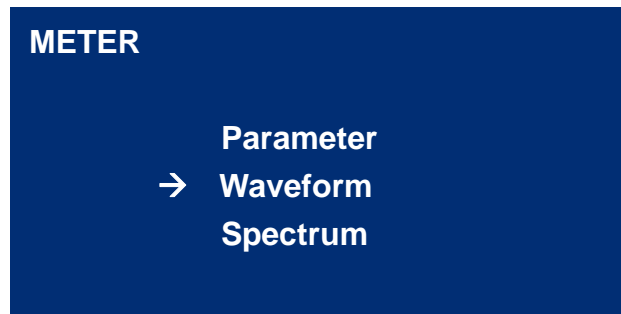
Vab : Line Voltage between "A" & "B" Phase  
THD : Total Harmonic Distortion in percentage  
Ia : "A" phase current

### TO VIEW THE ELECTRICAL WAVEFORM

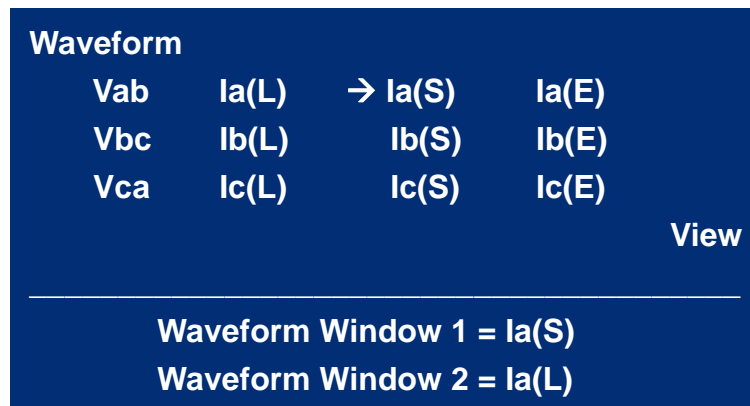
1. Use the “Up” or “Down” key to scroll to “METER”; select by pressing the Confirmation/Enter Key.



2. Once inside the “METER” menu, scroll to “WAVEFORM”; select by pressing using the Confirmation/Enter Key.



3. In this menu, use the Directional Scrolling Key Pads & Confirmation/Enter Key to select the desired waveform parameters you wish to view. You can choose up to 2 parameters for viewing. The waveforms will be displayed on “WAVEFORM WINDOW 1” & “WAVEFORM WINDOW 2” respectively.



- Once you have selected the desired parameters, go to "VIEW" on the right of the screen and press the Confirmation/Enter Key. The Waveforms will be displayed in the next screen.

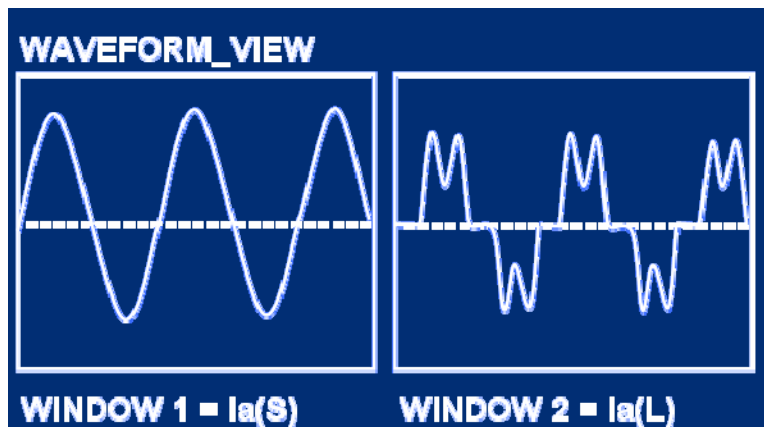
| Waveform |       |       |       |
|----------|-------|-------|-------|
| Vab      | Ia(L) | Ia(S) | Ia(E) |
| Vbc      | Ib(L) | Ib(S) | Ib(E) |
| Vca      | Ic(L) | Ic(S) | Ic(E) |

→ View

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Waveform Window 1 = Ia(S)  
Waveform Window 2 = Ia(L)

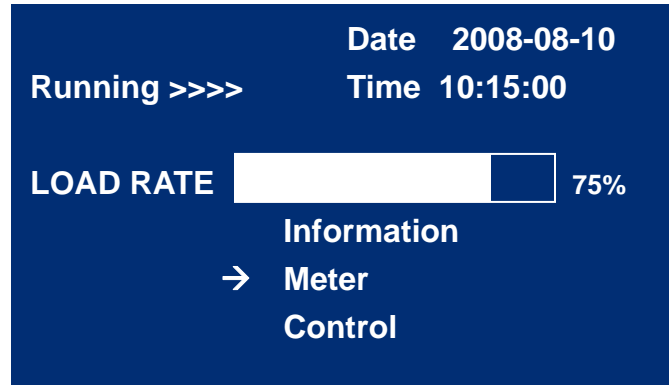
- View desired waveforms in windows 1 and 2.



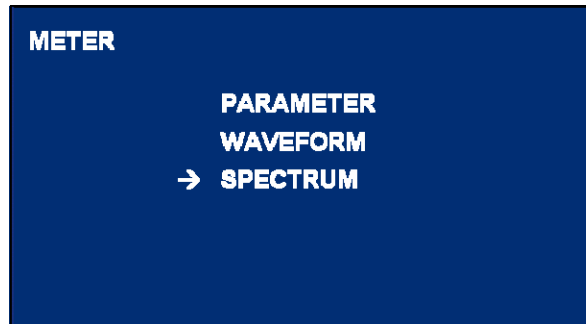
Vab : Line voltage waveform between "A" & "B" phase  
 Ia(L) : "A" phase current waveform at Load side  
 Ia(S) : "A" phase current waveform at Source side  
 Ia(E) : "A" phase current waveform at Sine side

## TO VIEW THE HARMONICS SPECTRUM

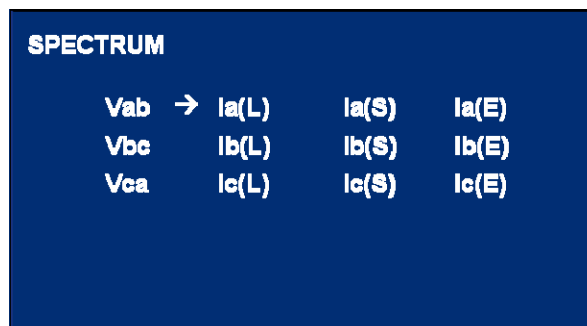
1. Use the “Up” or “Down” key to scroll to “METER”, select by pressing the Confirmation/Enter Key.



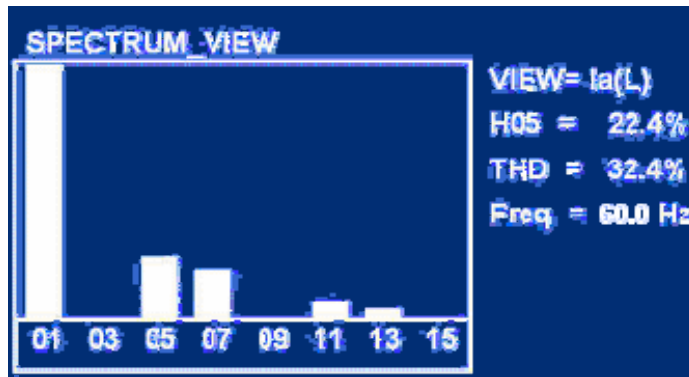
2. Once inside the “METER” menu, scroll to “SPECTRUM” and select by pressing the Confirmation/Enter Key.



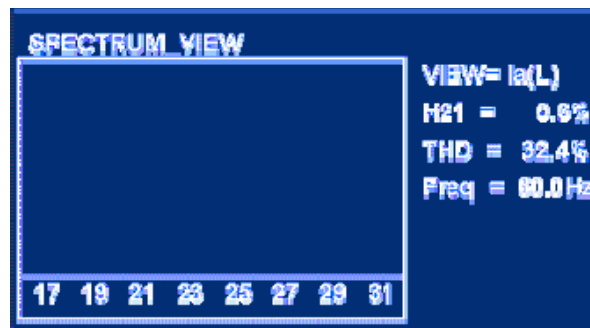
3. In this menu, use the Directional Scrolling Key Pads & Confirmation/Enter Key to select the desired spectrum parameters you wish to view. The first screen will display the spectrum for 1 to 15 harmonics order.



4. In the “SPECTRUM VIEW” screen, use the “Left” or “Right” key to view the THD % of each respective harmonic order.



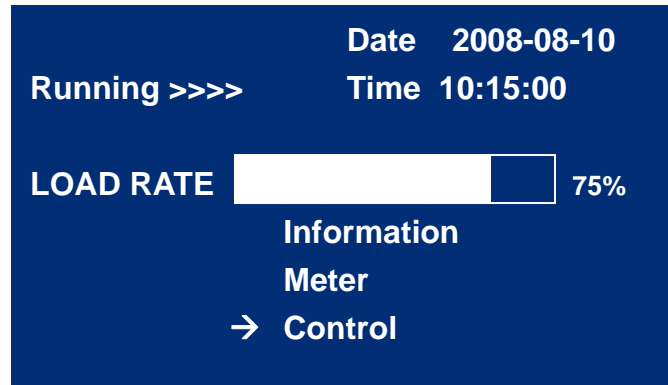
5. Use the “Up” or “Down” key to display the spectrum for the 17th to 31st order harmonics.



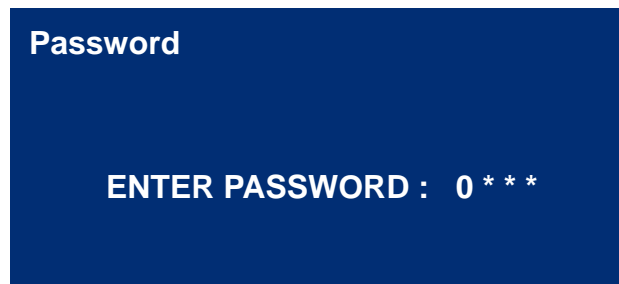
- VIEW= Ia(L) : Represents the electrical parameter presently selected to view the spectrum.  
(Example: the above screen displays the spectrum for “A” phase current (Ia(L)at load side).
- H21 = 0.3% : The 21st harmonic order is 0.3% of the fundamental value (1<sup>st</sup> harmonic order)
- THD = 32.4% : Total Harmonics Distortion is 32.4%.
- Freq = 60.0Hz : Fundamental frequency is 60Hz.

## CONTROL MENU - TO ACCES THE CONTROL MENU

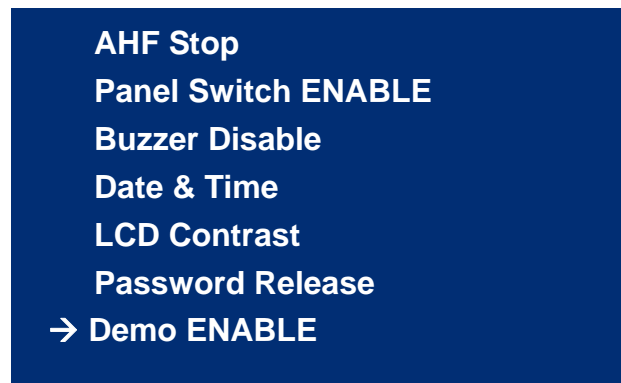
1. Use the “Up” or “Down” key to scroll to “CONTROL”; select by pressing the Confirmation/Enter Key.



2. The system will ask for password before displaying the CONTROL menu screen. To enter the password, use the “Up” or “Down” key to select from 0 ~ 9 for each digit, and the “Left” or “Right” key to move from the 1<sup>st</sup> digit to the 4<sup>th</sup> digit. Use the Confirmation/Enter key to confirm the selected password. The default password is “0000”.

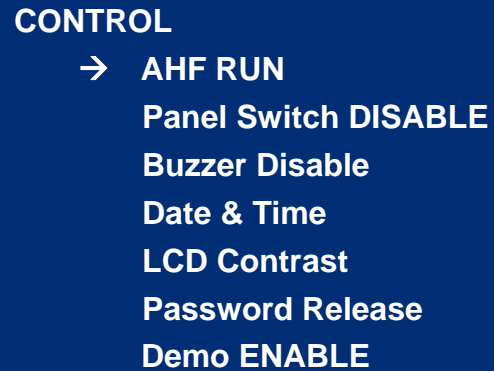


3. Once password is confirmed by the system, the CONTROL menu screen will be displayed. Scroll and select the desired function using the “Up” or “Down” Key and Confirmation/Enter Key.



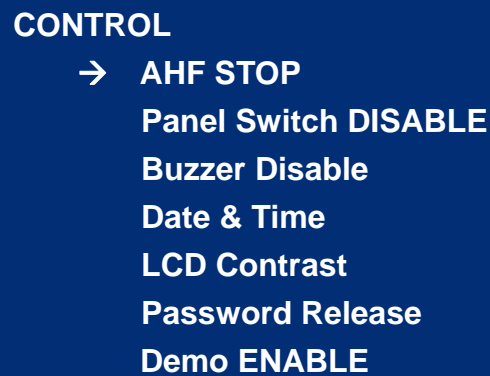
## TO ENABLE FILTERING OF THE SINE

1. The screen will display “RUN” command when the system is not providing filtering. Follow the start-up procedures as described in section 2 and press Confirmation/Enter Key to energize the AHF.



**CONTROL**  
→ **AHF RUN**  
**Panel Switch DISABLE**  
**Buzzer Disable**  
**Date & Time**  
**LCD Contrast**  
**Password Release**  
**Demo ENABLE**

2. Once the AHF is turn-on successfully, the screen will change to “ STOP” and the “Filtering” Green LED indicator will light up.



**CONTROL**  
→ **AHF STOP**  
**Panel Switch DISABLE**  
**Buzzer Disable**  
**Date & Time**  
**LCD Contrast**  
**Password Release**  
**Demo ENABLE**

## TO DISABLE FILTERING OF THE SINE

1. The screen will display “STOP” command when the system is providing filtering. Follow the shut-down procedures as described in section 3 and press Confirmation/Enter Key to turn-off the AHF.

### CONTROL

→ AHF STOP  
Panel Switch DISABLE  
Buzzer Disable  
Date & Time  
LCD Contrast  
Password Release  
Demo ENABLE

2. Once the AHF is turn-off successfully, the screen will change to “RUN” and the “Filtering” Green LED indicator will turn off.

### CONTROL

→ AHF RUN  
Panel Switch DISABLE  
Buzzer Disable  
Date & Time  
LCD Contrast  
Password Release  
Demo ENABLE

## TO ENABLE ON/OFF KEYPAD SWITCH ON FRONT PANEL

1. The screen will automatically display “PANEL SWITCH ENABLE” command when the ON/OFF keypad switch on the front panel is not inhibited. Press Confirmation/Enter Key to enable the keypad switch.

### CONTROL

AHF STOP

→ Panel Switch ENABLE

Buzzer Disable

Date & Time

LCD Contrast

Password Release

Demo ENABLE

2. The screen will change to “PANEL SWITCH DISABLE” command when the ON/OFF keypad switch on the front panel is active.

### CONTROL

AHF STOP

→ Panel Switch DISABLE

Buzzer Disable

Date & Time

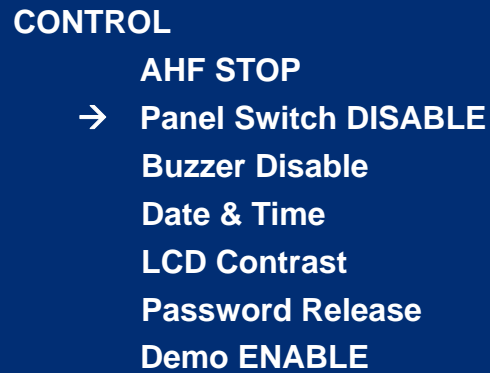
LCD Contrast

Password Release

Demo ENABLE

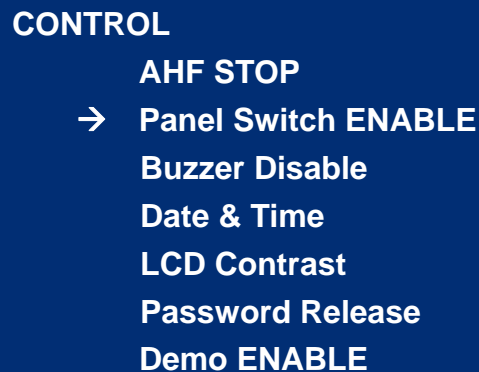
## TO DISABLE ON/OFF KEYPAD SWITCH ON FRONT PANEL

1. The screen will display “PANEL SWITCH DISABLE” command when the ON/OFF keypad switch on the front panel is active. Press Confirmation/Enter Key to disable the keypad switch. This is to prevent unauthorized operation of the ON/OFF keypad switch.



**CONTROL**  
AHF STOP  
→ Panel Switch DISABLE  
Buzzer Disable  
Date & Time  
LCD Contrast  
Password Release  
Demo ENABLE

2. The screen will change to “PANEL SWITCH ENABLE” command when the ON/OFF keypad switch on the front panel is inhibited.



**CONTROL**  
AHF STOP  
→ Panel Switch ENABLE  
Buzzer Disable  
Date & Time  
LCD Contrast  
Password Release  
Demo ENABLE

## TO ENABLE ALARM BUZZER

1. The screen will automatically display “BUZZER ENABLE” command when the buzzer is inhibited. Press Confirmation/Enter Key to enable the buzzer.

### CONTROL

AHF STOP

Panel Switch DISABLE

→ Buzzer Enable

Date & Time

LCD Contrast

Password Release

Demo ENABLE

2. The screen will change to “BUZZER DISABLE” command when the buzzer is active.

### CONTROL

AHF STOP

Panel Switch DISABLE

→ Buzzer Disable

Date & Time

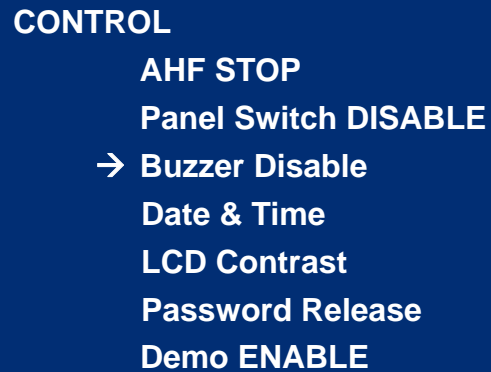
LCD Contrast

Password Release

Demo ENABLE

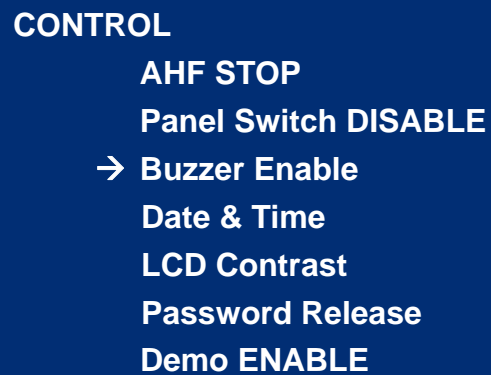
## TO DISABLE ALARM BUZZER

1. The screen will automatically display “BUZZER DISABLE” command when the buzzer is active. Press Confirmation/Enter Key to disable the buzzer.



**CONTROL**  
AHF STOP  
Panel Switch DISABLE  
→ Buzzer Disable  
Date & Time  
LCD Contrast  
Password Release  
Demo ENABLE

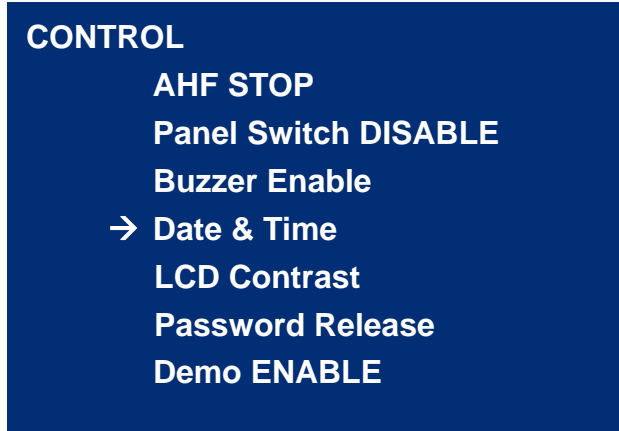
2. The screen will automatically change to “BUZZER ENABLE” command when the buzzer is inhibited.



**CONTROL**  
AHF STOP  
Panel Switch DISABLE  
→ Buzzer Enable  
Date & Time  
LCD Contrast  
Password Release  
Demo ENABLE

## DATE & TIME SETTING

1. In the “CONTROL” menu screen, scroll to “DATE & TIME SET”; select by pressing the Confirmation/Enter Key.



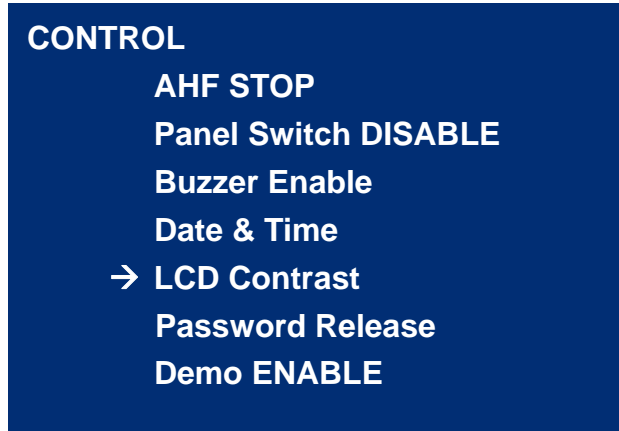
2. In the “DATE & TIME SET” screen, use the “Up” or “Down” key to select the desire field. The selected field will blink continually. Use the “Left” or “Right” key to enter the desire date & time.



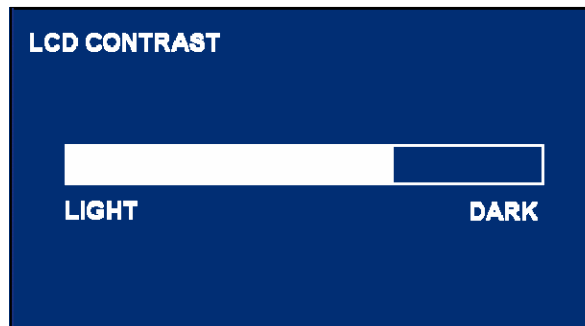


## TO ADJUST THE LCD SCREEN CONTRAST

1. In the “CONTROL” menu screen, scroll to “LCD CONTRAST”; select by pressing the Confirmation/Enter Key.



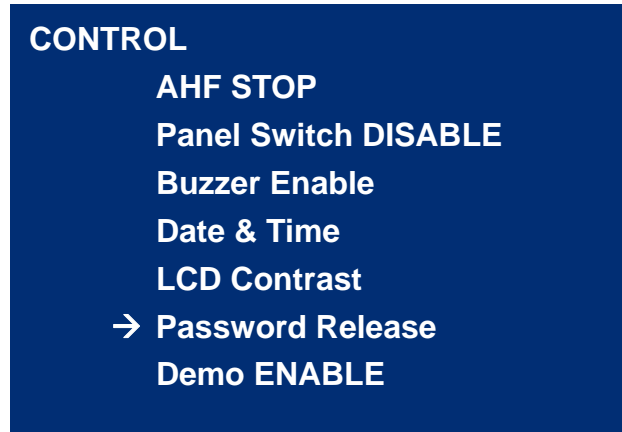
2. In the “LCD CONTRAST” screen, use the “Left”, “Right” key to adjust the desire contrast.



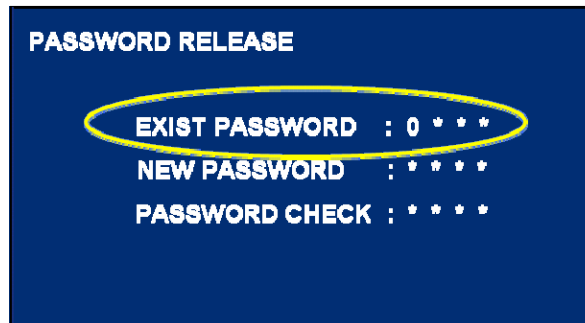
***Note: If the contrast is set too dark, the display may not be visible for easy reading.***

## TO CHANGE THE DISPLAY CONTROL PASSWORD

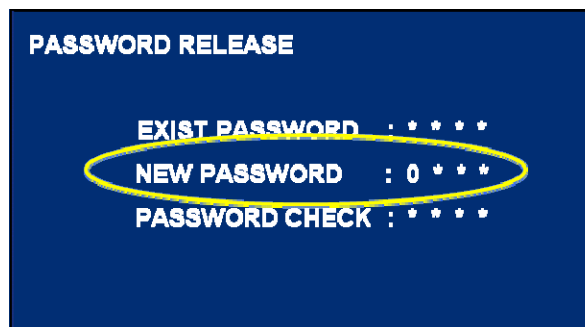
1. In the “CONTROL” menu screen, scroll to “PASSWORD RELEASE”; select by pressing the Confirmation/Enter Key.



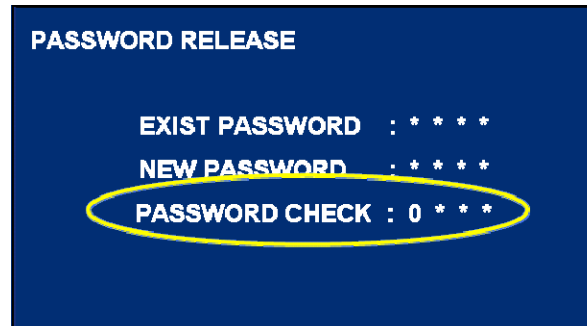
2. In the “EXIST PASSWORD” field, enter the existing (or default) password using the Directional/Scrolling Keys and confirm the entry by pressing the Confirmation/Enter Key.



3. Next, enter the new desire password in the “NEW PASSWORD” field as per above.

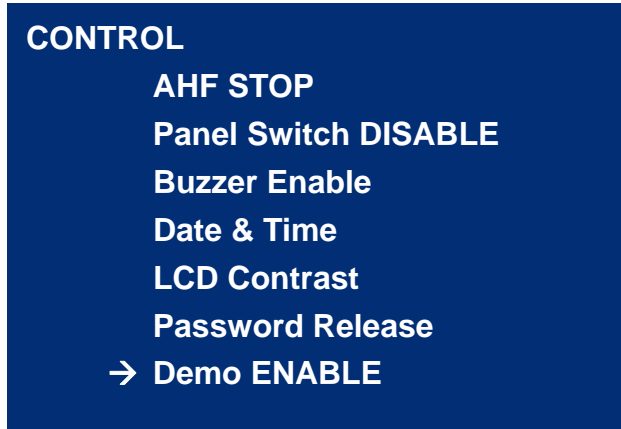


4. Re-enter the new desire password in the "PASSWORD CHECK" field to confirm the new password.

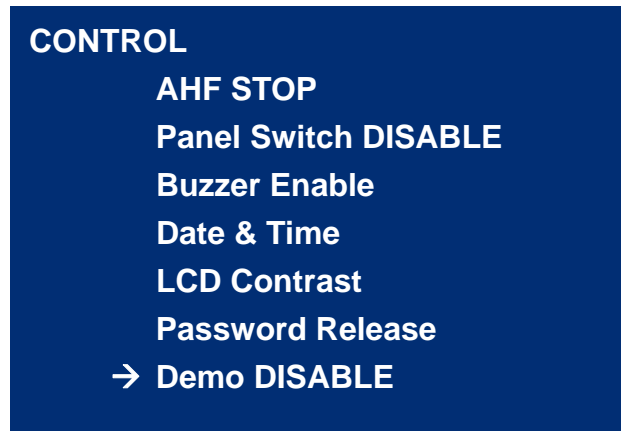


### TO ENABLE THE DEMO PROGRAM

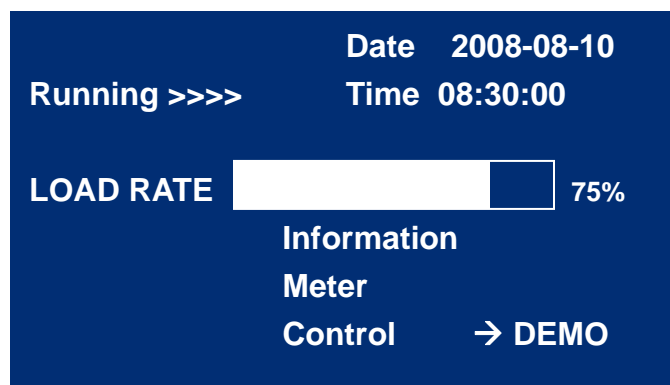
1. The system contains a demo program to display the various functions of the control panel. The factory default of this demo program is disable. When you need to enable this program, go to “DEMO ENABLE” command in the “CONTROL” menu screen and press the Confirmation/Enter Key.



2. The screen will change to “DEMO DISABLE” command when the demo program is active. The “DEMO” command will appear on the main menu screen.



3. Scroll to “DEMO” and press the Confirmation/Enter Key, the screen will start to continuously display the various functions of the control panel. Press the Escape Key to stop.

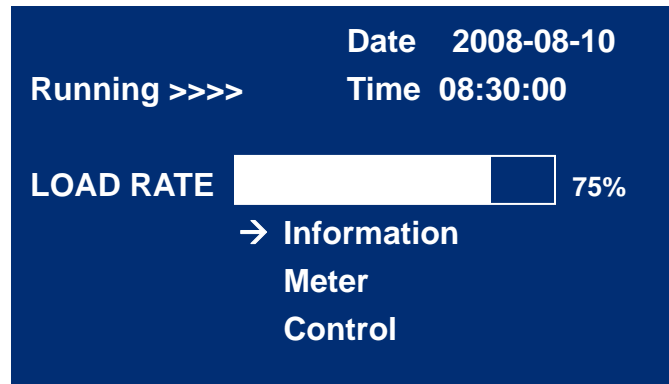




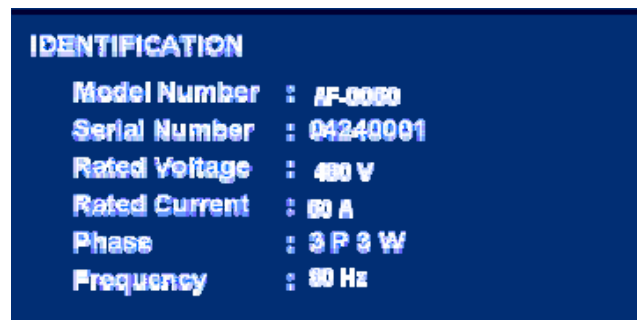
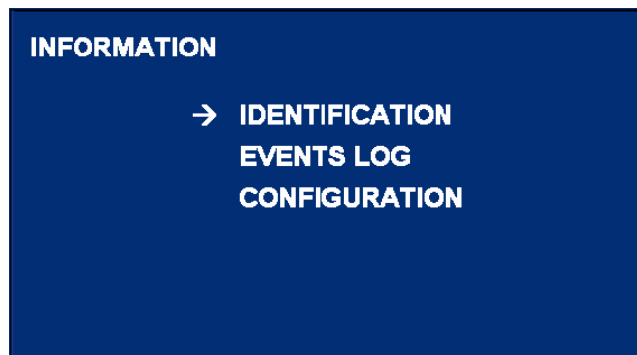
## INFORMATION MENU

### TO DISPLAY SINE SYSTEM INFORMATION

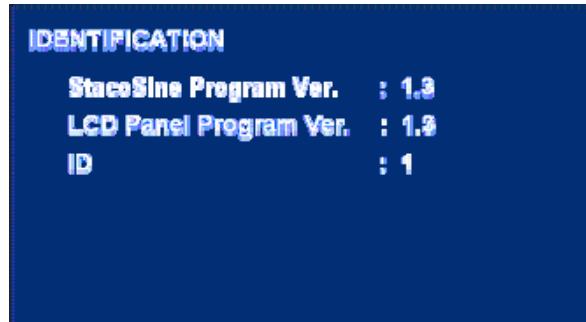
1. Scroll to "INFORMATION"; select by pressing the Confirmation/Enter key.



2. In the "INFORMATION" menu screen, scroll to "IDENTIFICATION"; select by pressing the Confirmation/Enter key. Sine system information will be displayed.

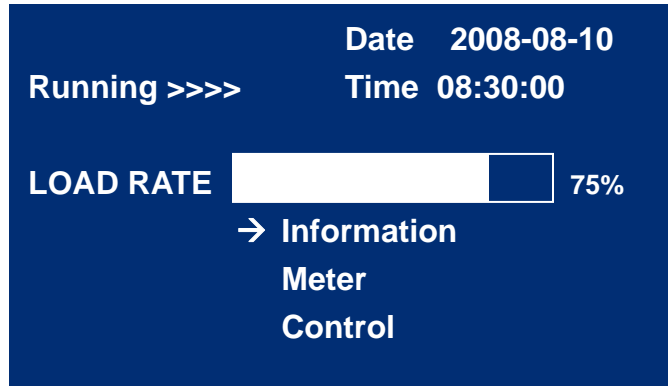


3. In the “IDENTIFICATION” menu screen, use the “Up” or “Down” key to view Sine Program Version, LCD Panel Program Version, and ID (address number).

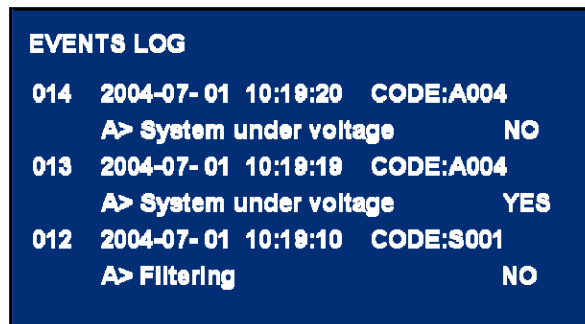
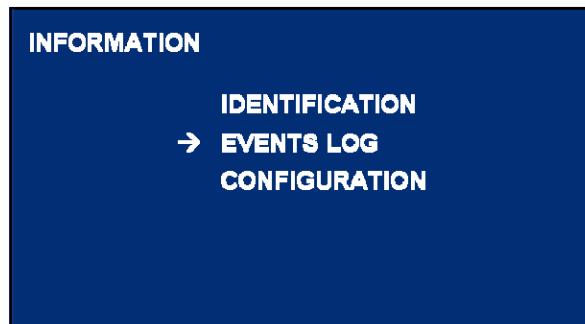


**TO DISPLAY EVENTS LOG**

1. Scroll to "INFORMATION"; select by pressing the Conformation/Enter key.

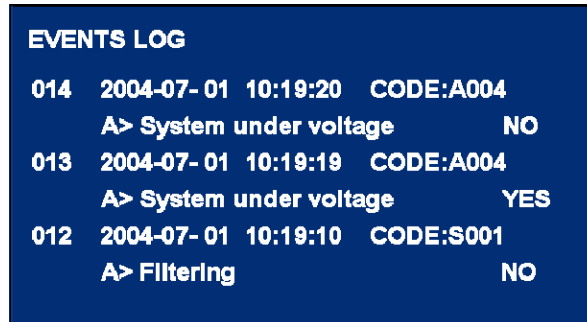


2. In the "INFORMATION" menu screen, scroll to "EVENTS LOG"; select by pressing the Confirmation/Enter key. The events log will be displayed. Use "Up" or "Down" key to browse the events. The log capacity is 300 lines with FIFO (First In & First Out) principle.



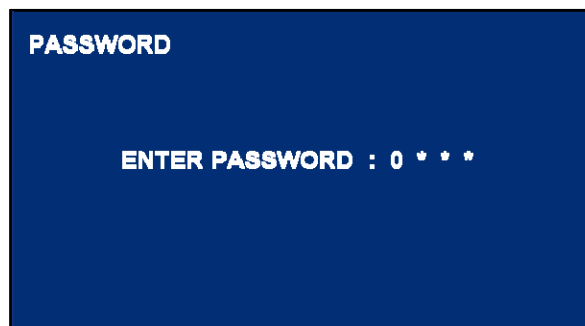
## TO CLEAR EVENTS LOG

1. In the “EVENTS LOG” screen, press the Confirmation/Enter key to access the “PASSWORD” screen.



| EVENTS LOG |                         |           |     |
|------------|-------------------------|-----------|-----|
| 014        | 2004-07-01 10:19:20     | CODE:A004 |     |
|            | A> System under voltage |           | NO  |
| 013        | 2004-07-01 10:19:19     | CODE:A004 |     |
|            | A> System under voltage |           | YES |
| 012        | 2004-07-01 10:19:10     | CODE:S001 |     |
|            | A> Filtering            |           | NO  |

2. To enter the password, use the “Up” or “Down” key to select from 0 ~ 9 for each digit, and the “Left” or “Right” key to move from the 1 digit to the 4 digit. Use the Confirmation/Enter key to confirm the selected password. Once password is accepted by the system, the “CAUTION” will be displayed.

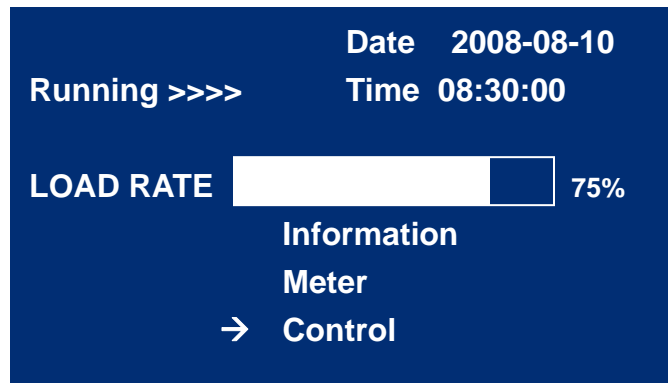


3. If you want to clear the events log, use the “Left” or “Right” key to select “YES” then press the Confirmation/Enter Key to confirm the action. Go back the “EVENTS LOG” screen to confirm the log has been cleared.

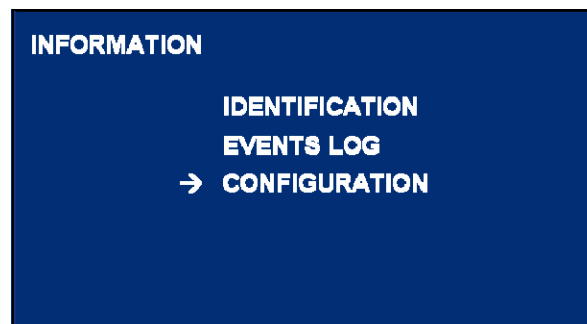


### TO DISPLAY SINE CONFIGURATION

1. Scroll to “INFORMATION”; select by pressing the Confirmation/Enter key.



2. In the “INFORMATION” menu screen, select “CONFIGURATION” by pressing the Confirmation/Enter key. Sine system configuration will be displayed.



| CONFIGURATION             |         |
|---------------------------|---------|
| Harmonic Compensation     | ENABLE  |
| Higher-order Compensation | ENABLE  |
| 3rd Harmonic              | DISABLE |
| 5th Harmonic              | ENABLE  |
| 7th Harmonic              | ENABLE  |
| 11th Harmonic             | ENABLE  |
| 13th Harmonic             | ENABLE  |
| 17th Harmonic             | DISABLE |
| 19th Harmonic             | DISABLE |
| 23th Harmonic             | DISABLE |
| 25th Harmonic             | DISABLE |

- In the “CONFIGURATION” menu screen, use the “Up” or “Down” key to view the Smart Save Energy, Reactive Power Regulation, and Application Mode settings.

| CONFIGURATION             |         |
|---------------------------|---------|
| Smart Save Energy         | DISABLE |
| Reactive Power Regulation | DISABLE |
| Application Mode          | 0       |

**Note: If you want to change the setting of “CONFIGURATION”, please contact local authorized service agent.**

**Technical support is available when you contact us any of these methods:**

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