

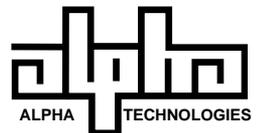
# ■ Operator's Manual

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## ■ Information Management Using the Intelligent Interface Device

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FROM ALPHA TECHNOLOGIES





# ■ **Operator's Manual**

## ■ **Information Management Using the Intelligent Interface Device**

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# 1. INTRODUCTION

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## Unpacking and Inspection

The Intelligent Interface Device, standard with the CFR 7.5K, CFR 10K, and CFR 15K, requires no installation. It is optional on all other CFR units and comes either factory installed or as a user-installable kit. Note: The Intelligent Interface Device is not user-installable on the CFR 600 or CFR 1000. If the unit is going to be used in a remote application, it simply plugs into the MMJ connector located on the back of all CFR units.

If ordered separately, carefully remove the Intelligent Interface Device Kit from its shipping container. Inspect the contents. If items appear to be damaged or missing, contact Alpha Technologies and the shipping company immediately. Most shipping companies have only a short claim period. Make sure the following items have been included:

1. Intelligent Interface Device
2. Operator's Manual
3. Any other ordered options (i.e., interface cables, etc.)

### **SAVE THE ORIGINAL SHIPPING CONTAINER.**

In the event the unit needs to be returned for service, it should be packaged in its original shipping container. If the original container is not available, make sure that the unit is packed with at least three inches of shock-absorbing material to prevent shipping damage. Note: Do not use popcorn-type material. Alpha Technologies is not responsible for damage caused by the improper packaging of returned units.

### **PLEASE READ THE OPERATOR'S MANUAL.**

Become familiar with the Intelligent Interface Device by reviewing the drawings and illustrations contained in the manual before proceeding. If you have questions regarding the safe installation or operation of the unit, contact Alpha Technologies.

## How To Use This Manual

The manual has been designed to introduce and familiarize you with the various features of the Alpha Intelligent Interface Device. It will guide you through all phases of the unit, from installation through operation, either locally from the keypad or remotely via a computer terminal.

The **Installation** section contains easy step-by-step instructions for installing the Intelligent Interface Device into an Alpha CFR UPS.

The **Operation** section guides you through the Intelligent Interface Device's extensive menuing system. This section includes the basic setup and gives a brief explanation of the selections that are available, including what options activate, control and monitor the UPS.

The **Remote Communication Interface** section provides an overview of the available options, along with detailed instructions and illustrations.

Icons have been placed throughout the manual to highlight key commands using remote terminal emulation. The icons provide short cuts to desired display screens without having to step through various menus. To use the icons, simply enter the number contained in the icon screen while you are in the terminal emulation mode. A dark screen icon with white numbers will take you to a main menu. A light screen icon with black numbers will place you directly into the chosen sub-menu function.



The dark screen icon with white lettering will take you directly to a main menu. In this example, the #5 (USER PARAMETERS) will appear.



The light screen icon with black lettering will take you directly to a sub-menu. In this example, the #51 (USER PARAMETERS-SET TIME) will appear.



This function is not independently selectable as a sub-menu item. It is included as part of the USER PARAMETERS main screen selection.



This function cannot be set, (or accessed), via terminal emulation. You must use the keypad on the Intelligent Interface Device.

### Typical PC Communication Icons

# 1. INTRODUCTION

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## The Intelligent Interface Device

Alpha's Intelligent Interface Device provides precise UPS system information at the touch of a finger. The front panel keypad and LCD guide you through the various menu options which include Battery Temperature, Input Voltage and Current<sup>1</sup>, Line Frequency, Output Voltage and Current, Input and Output VA<sup>1</sup>, Power in Watts<sup>1</sup>, Power Factor, Battery Voltage and Charger Current, Charger Status, and more. The History Log maintains an on-going record of UPS alarms and power anomalies by time, date and type of occurrence. Whenever a UPS alarm condition occurs, such as Line Failure, Low Battery Warning, Low Battery Shutdown or Service, it is displayed by the front panel indicators and recorded in the History Log.

The Intelligent Interface Device is equipped with an RS-232 port, configured as a DCE (Data Communications Equipment) device. This allows the CFR UPS to communicate via a remote terminal or computer. It can also be integrated into a LAN as a shared modem device. Baud rates from 300 to 9600 are user-selectable. The optional internal modem and rear panel RJ-11 jacks allow long range remote communications with any computer and its terminal emulation program. The Intelligent Interface Device can also be located up to 2,000 feet from the UPS, using the rear panel MMJ connector, for remote status monitoring applications.

When the CFR, along with its Intelligent Interface Device, is used with AlphaNet™ Network Power Management software, the network automatically notifies system users of changes in UPS status as they occur. Since the software constantly monitors the AC Line and UPS battery conditions, it can perform orderly fileserver or workstation shutdowns whenever UPS battery power becomes unacceptably low. AlphaNet™ supports most popular operating systems and is ideal for unattended operation. If a critical condition does occur, the unit can dial up an emergency number, using its optional internal modem, to notify the system manager of the UPS status.

<sup>1</sup> Note: Input Current, Input VA and Input Watts are optional on some units.



Intelligent Interface Device

## Front Panel Indicators

In addition to the LCD display, the Intelligent Interface Device uses backlit LED's to indicate LINE PRESENT, LINE FAILURE, LOW BATTERY WARNING, LOW BATTERY SHUTDOWN and SERVICE. The indicators provide important front panel status information and remain ON to display the UPS status until the current condition changes. When alarms such as LOW BATTERY WARNING occur, information relating to the alarm can then be viewed in the LCD's ALARM HISTORY file. The indicators are entirely independent of the front panel display and are not affected by the key functions. By using the two sets of indicators (LCD and LED's), the status of the UPS can be accurately monitored under all conditions.

- \* **"LINE PRESENT"** is ON whenever the UPS is running on acceptable AC Line power.
- \* **"LINE FAILURE"** will light whenever the UPS loses line power or line power is unacceptable.
- \* **"LOW BATTERY WARNING"** is ON whenever the UPS is preparing to shutdown due to a LOW BATTERY condition.
- \* **"LOW BATTERY SHUTDOWN"** is ON whenever the UPS has shut itself down due to a LOW BATTERY condition.
- \* **"SERVICE"** is ON whenever the UPS requires service.



Front Panel Indicators

# 1. INTRODUCTION

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## Front Panel Screens

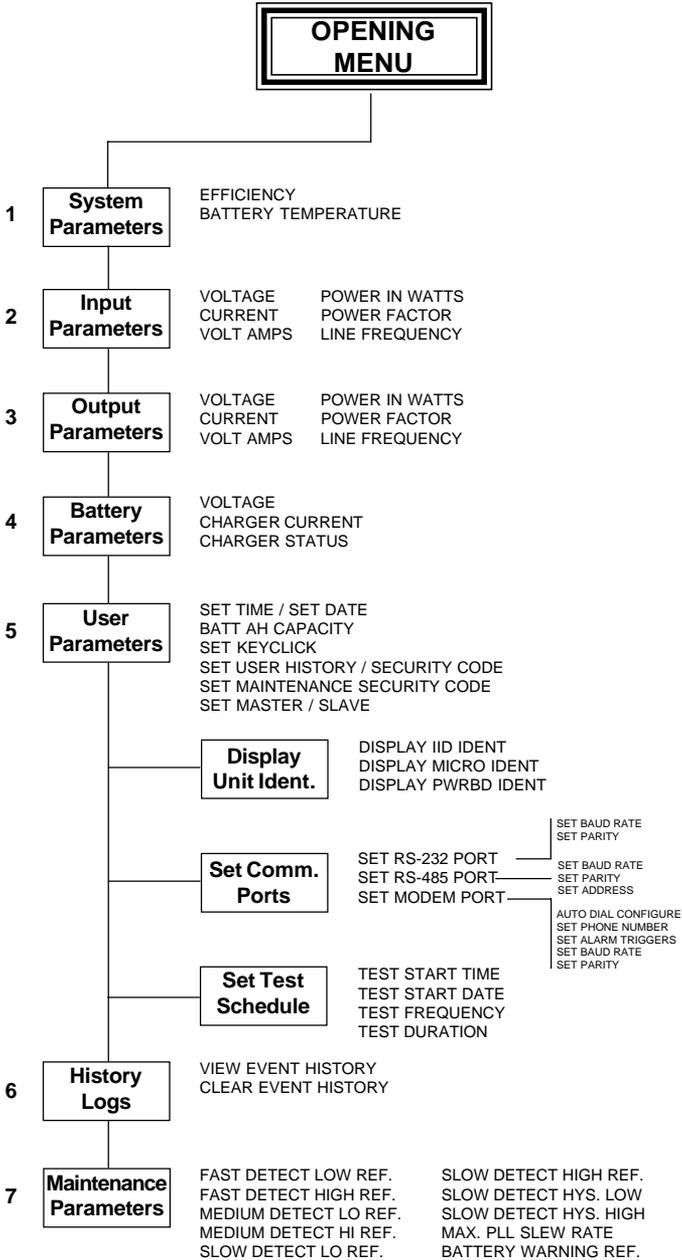
The LCD display used on the Intelligent Interface Device provides vital UPS status information. Screens are displayed, one at a time, by pressing the ARROW keys on the front panel keypad. Main screens (menus) are linearly sequenced (see next page), starting with the Alpha Technologies (TIME and DATE) default screen. Once the OPENING MENU is displayed, options within the screen allow you to select specific parameter screens. Information is displayed for 2 minutes, before the unit returns to the default screen.



**Initial display before a keypress**



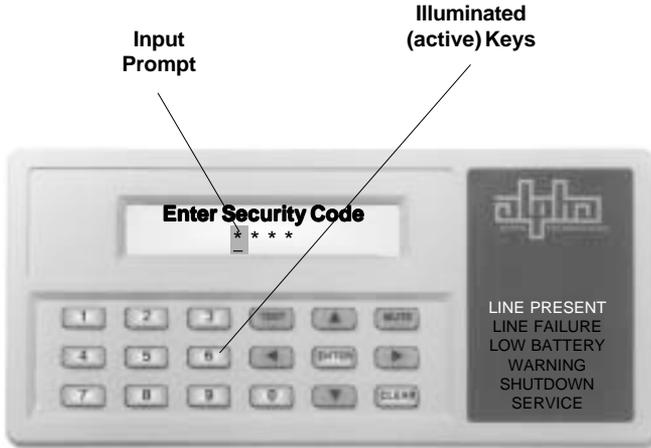
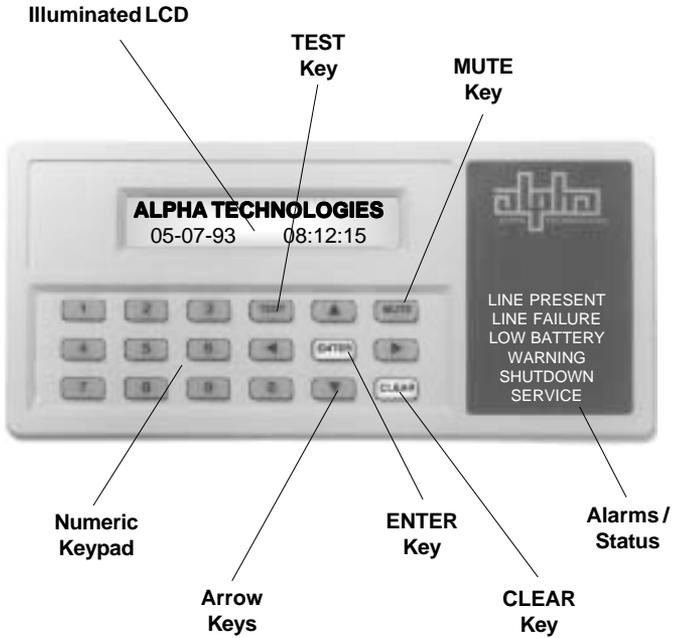
**Press CLEAR to return to the DEFAULT screen.  
Note the ARROW keys are now illuminated along with the display.**



Flowchart of Menus and Options

# 1. INTRODUCTION

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**Intelligent Interface Device User Features**

### Front Panel Features

The front panel of the Intelligent Interface Device is designed to be easy to use and extremely flexible to provide you with a wide range of information management options. The panel is designed so that it can be used in total darkness without the need for any additional lighting.

#### **Illuminated LCD**

The front panel LCD displays all UPS operating parameters including input / output conditions, load, battery state, charger status, etc. The display also allows you to view events recorded in the HISTORY logs, plus view parameters as they are entered. The display is normally dark. Pressing any of the keys will automatically switch ON the backlighting feature. The backlighting will remain ON for 2 minutes and darken again unless another key is pressed.

#### **Test Key**

The TEST key places the unit into a 1 minute self-test mode, indicated by a lighted key, to verify the backup capabilities of the UPS. Test can be initiated directly from the keypad, a remote unit, or autotest. Automatic test conditions can be entered using the USER PARAMETERS menu, (see Section 3, "User Parameters" for setup details). Press the key again to cancel self-test.

#### **Mute Key**

The MUTE key silences the audible alarm activated during a LINE FAILURE condition, or during self-test. It also can be used to silence several service alarms. Once the key is pressed, the audible alarm will remain OFF until the next alarm condition occurs.

#### **Numeric Keypad**

The numeric keypad is used for entering data such as date and time information, security codes, and setup parameters. Selections are input only after pressing the ENTER key.

#### **Arrow Keys**

The four arrow keys are used for paging through the various menus and viewing events in the HISTORY menus.

#### **Enter Key**

The ENTER key is used to input data from the numeric keypad or to select the menu displayed in the LCD. The ENTER key is always illuminated and always active.

#### **Clear Key**

The CLEAR key is used to back out of any information that was typed on the keypad before using the ENTER key. It is also used to back out of any selected function or menu. The CLEAR key is always illuminated and always active.

### Front Panel Features, *continued*

#### **Illuminated Keys**

Illuminated keys are active and can be used for entering data or selection of menus, etc. Non-illuminated keys are not available for the selected function and are inactive. Pressing a non-illuminated key will have no effect. Initially, either before using the keypad or after 2 minutes of inactivity, the display will be dark and only the ENTER and CLEAR keys will be illuminated. To activate the Intelligent Interface Device, you must first press any key. The selected functions then illuminate the keys required for input.

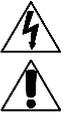
#### **Alarms / Status**

The Alarms / Status area displays the current operating mode of the UPS. Under normal operating conditions, the LINE PRESENT LED should be the only highlighted indicator. If an alarm is triggered by a line fault, the indicators will change to indicate the new status, and an audible tone will be sounded to alert you that a fault condition has occurred.

#### **Input Prompt**

The input prompt appears as an underscored character and a flashing dark box surrounding the item to be changed or entered. The prompt will advance one character to the right with each character you input. The active keys will illuminate, guiding you through the selection process. Pressing the ENTER key will accept your input, and the next selection or menu item will appear in the display.

### UPS Front Panel Installation



The CFR UPS is designed so that upgrading from a Standard Interface Device to an Intelligent Interface Device is as easy as removing the front panel and plugging in the new unit. Power should be completely removed before proceeding. Note: This should be performed only by qualified service personnel.

1. Disconnect all loads from the OUTPUT receptacles on the UPS.
2. Switch the rear panel BATTERY circuit breaker(s) OFF.
3. Switch the UPS OUTPUT switch OFF. Disconnect the UPS from the AC wall receptacle. If the unit is hardwired, switch the AC circuit breaker supplying the UPS OFF and mark the circuit "Out of Service".
4. If an external battery pack is connected to the UPS, remove the connector.
- 5a. *CFR-600 / CFR 1000 / CFR 1500 / CFR 2000 / CFR 2500* -  
Loosen the two (2) Phillips screws from the UPS front panel (in the lower grill). Gently pull the lower edge forward until the screws clear the chassis. Carefully lift the front panel straight-up until it clears the top edge of the unit. Disconnect the 34-conductor ribbon cable from the center of the panel's circuit board and set the entire assembly aside.
- 5b. *CFR 3000, CFR 4000, CFR 5000* -  
Loosen the single, captive fastener from the upper-rear panel and remove the cover. Loosen the two (2) front panel retaining screws from the upper-front panel. Slowly lower the front panel and remove the 34-pin ribbon connector.

Cover Screws or Captive Fastener  
(on rear panel)



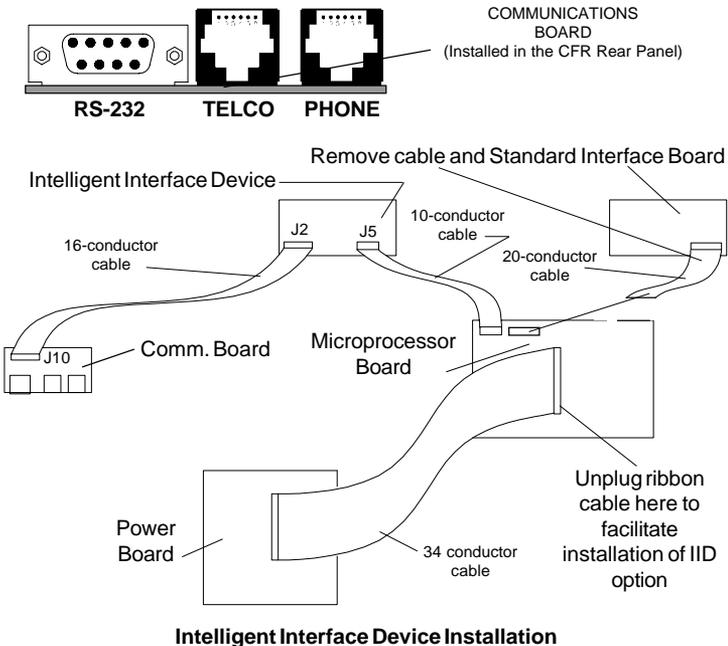
Front Panel Screws

### Front Panel Removal

## 2. INSTALLATION

### UPS Front Panel Installation, *continued*

7. Take the existing Standard Interface Device out of the front panel by removing the board's four corner mounting screws. Unplug the LED board's ribbon cable from the micro board and set the assembly aside.
8. Install the Intelligent Interface Device through the front panel and, using the brass tab with the four screws (removed in step 7), secure the assembly to the front panel. Connect the 10-conductor ribbon cable from (J5) to the microcontroller's 10-pin header (see below).
9. Remove the cover plate from the upper-right side of the UPS's rear panel, if applicable.
10. Install the Communications Board where the cover plate was located using the two HEX-Standoff screws. The Comm. Board is installed from the inside of the unit; the HEX screws are installed from the outside of the rear panel.
11. Connect the 16-conductor ribbon cable to the Comm. Board's 16-pin header (J10). Connect the other end of the cable to (J2) on the Intelligent Interface Device board.
12. Reinstall the UPS top cover. Reconnect the 34-conductor ribbon cable to the center of the microcontroller board (located on the CFR front panel). Reinstall the front cover ensuring that the two locating pin guides seat firmly into the holes in the top edge of the front chassis. After the pins are firmly seated, swing the lower-edge of the front panel back into place and tighten the two screws located in the lower grill.
13. Start the UPS and test it for proper operation (see Section 3).

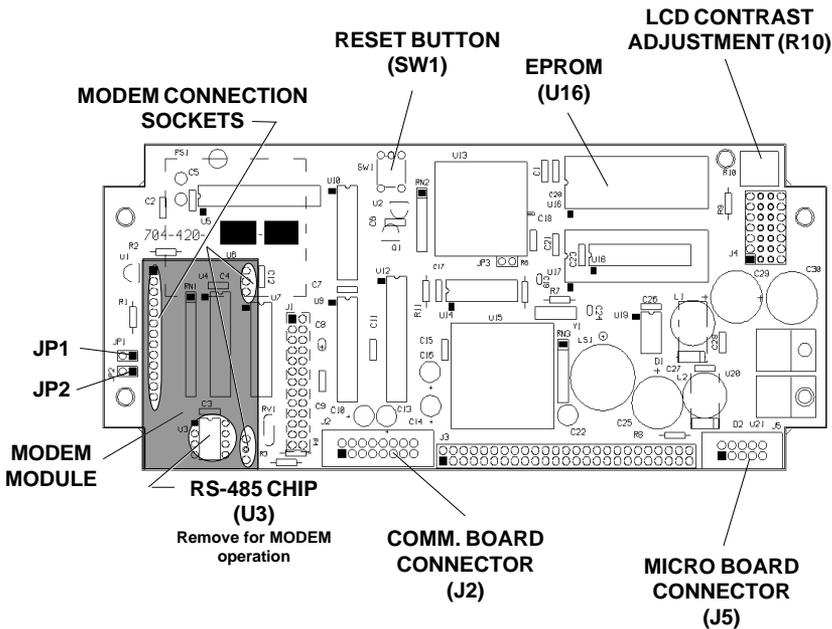


### Contrast Adjustment

If the display appears either too dark, (dark blocks are displayed along with the text), or too light, (no text displayed), carefully remove the front panel as previously described. Locate R10 and, using a small flat blade screwdriver, adjust the potentiometer clockwise to darken and counter-clockwise to lighten. Note: You may need to push a key on the keypad to turn on the backlighting. When the contrast is optimized, reattach the front panel.

### Reset Button

The reset button located on the Intelligent Interface Device Board will reset the board. The CFR front panel must be removed to access the reset button.



INTELLIGENT INTERFACE DEVICE BOARD

## 2. INSTALLATION

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### Remote Installation

The Intelligent Interface Device can also be used for remote applications away from the UPS. The distance is dependent upon the gauge of wire used: 300 feet with standard telephone line cord; 1,000 feet with 24 gauge cable; 2,000 feet with 22 gauge cable. The remote Intelligent Interface Device sits on a desktop and requires no additional retrofit. Simply plug its cable into the back of the UPS. Note: If you are using two Intelligent Interface Devices, one in the UPS and one as a remote unit, make sure that the unit used most often is configured as master (see Section 3 "User Parameters").

1. Mount the Intelligent Interface Device in the desired location.
2. Connect the cable to the MMJ jack in the back of the Intelligent Interface Device.
3. Connect the other end of the cable to the MMJ jack, labeled "I<sup>2</sup>D", on the back of the UPS. Note: The UPS can continue to run while plugging in the cable.
4. Test the unit for proper operation (see Section 3 "UPS Test").
5. Additional details regarding remote (serial and modem) operation can be found in Section 5 ("Communication Interface Options").

#### Remote I<sup>2</sup>D Connection



Rear-panel Communications Board

### UPS Startup



1. Plug the UPS power cord into a wall receptacle. If the UPS is hardwired, switch the AC circuit breaker ON. The "LINE PRESENT" indicator will come ON to indicate that the UPS is running on AC Line power. The other front panel indicators should be OFF.
2. Switch the rear panel "BATTERY" circuit breaker(s) ON to activate the DC circuit.
3. Test the unit for proper operation (see "UPS Test" below).

#### *WHEN AC LINE POWER IS NOT AVAILABLE:*

1. Plug the UPS power cord into a wall receptacle, or switch the AC circuit breaker ON. The "LINE PRESENT" indicator will remain OFF.
2. Switch the rear panel "BATTERY" circuit breaker(s) ON to activate the DC circuit.
3. Press the TEST key located on the front panel keypad. The switch will start the UPS from battery power. Since many computer and telephone systems require two to three times their maximum input amperage during start-up, it may be necessary to reduce the load in order to start the UPS. Run time is limited to the condition of the batteries and UPS loading.  
Note: When the UPS first starts, it will emit a continuous tone to indicate a cold start. To defeat the tone, press the MUTE switch.

### UPS Test

1. Test the UPS by unplugging the AC power cord from the wall receptacle, or by switching OFF the AC circuit breaker (hardwired units). The front panel amber "LINE FAILURE" LED will light as the UPS initiates LINE FAILURE operation.
2. Plug the AC power cord back into the wall receptacle, or switch the AC circuit breaker ON. The "LINE PRESENT" LED will come ON to indicate the presence of AC Line power. Within 20 seconds the "LINE FAILURE" LED will shut OFF to indicate that the UPS has resumed LINE PRESENT operation.
3. Once the UPS has been tested, connect the load to the rear panel output receptacles. Note: The load should be switched OFF prior to connection.

Note: The UPS can also be tested by pressing the TEST key on the Intelligent Interface Device. To end the 1-minute self-test, press the TEST key again.

### Set Time and Date

1. Access the USER PARAMETER menu and enter the security code.
2. Select the SET TIME screen and set the (HH-MM-SS) fields using the # keys on the keypad or the up or down arrows to advance or decrement the entries. Press the ENTER key to exit the screen.
3. Select the SET DATE screen and set the (MM-DD-YY) fields using the # keys on the keypad or the up or down arrows to advance or decrement the entries. Press the ENTER key to exit the screen.

### 3. OPERATION

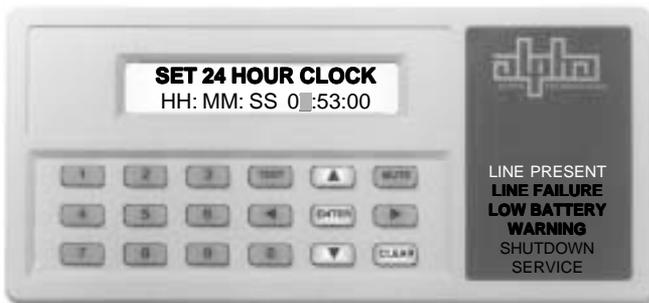
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**AVAILABLE KEYS FOR SETTING TIME OR DATE**



**PRESSING A NUMBER KEY WILL SWITCH THE KEYPAD TO ALL NUMBERS SELECTION**



**PRESSING AN ARROW KEY WILL SWITCH THE KEYPAD TO ALLOW YOU TO COMPLETE THE ENTRY USING THE ARROW KEYS**

## Front Panel Indicators

### Line Present

"LINE PRESENT" indicates that the UPS is running on AC Line power. Whenever a utility outage occurs, the indicator turns OFF. Once utility power returns, the indicator comes ON to signal that the UPS has resumed AC LINE operation.

### Line Failure

"LINE FAILURE" indicates that the UPS is providing backup power to the output. LINE FAILURE mode is activated (without interruption to the load) whenever incoming AC Line power is unacceptably high or low, or a complete utility power outage occurs.

### Low Battery Warning

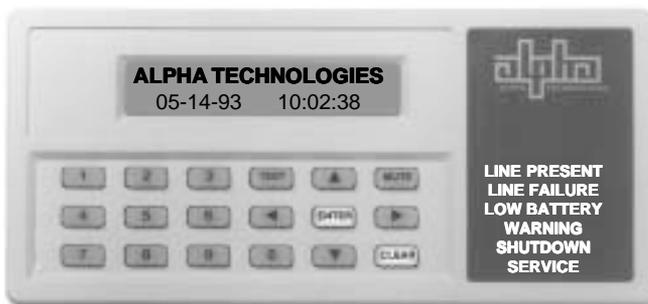
"LOW BATTERY WARNING" indicates that UPS shutdown is imminent. An orderly shutdown of all loads connected to the UPS should be performed as soon as possible. This alarm is activated by a low battery voltage. Note: Depending upon the loading on the UPS and the age of the batteries, SHUTDOWN can occur within a few minutes of the alarm.

### Low Battery Shutdown

"LOW BATTERY SHUTDOWN" indicates that LINE FAILURE operation has been shutdown to prevent overdischarge damage to the batteries.

### Service

"SERVICE" is activated whenever the UPS requires maintenance. This usually is an indication that the batteries are no longer able to hold a charge and should be replaced. NOTE: The UPS will not support backup power under this condition.



The Intelligent Interface Device - ALARMS

### 3. OPERATION

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#### Alpha Technologies (DEFAULT) Screen

The "ALPHA TECHNOLOGIES" default screen displays date and time information. The default screen is continually displayed until another screen is selected from the front panel keypad. Whenever a screen is left idle for 2 minutes, the unit will return to the default screen. Note: The display will also go into a "sleep" mode (extinguishing the backlighting on the LCD and keypad to conserve energy) whenever it is left idle for 2 minutes or more. When a front panel key is pressed, the display will light, as will the keypad to guide you through the menu.



#### Opening Menu

Whenever a front panel key is pressed with the default screen displayed, the OPENING MENU appears and prompts you to make a selection. At the same time, the keys on the keypad that relate to the menu prompts are lighted. Press the > arrow to advance to the various main menus (SYSTEM PARAMETERS, INPUT PARAMETERS, OUTPUT PARAMETERS, etc.). Press the < to step back through the main menus. Press ENTER when the correct menu appears.



Press **CLEAR** to return to the **DEFAULT** screen.

## System Parameters



The "SYSTEM PARAMETERS" screen provides UPS efficiency and battery temperature information. The main menu prompts you to select the option, or to press the > arrow to advance through the various parameter screens; or < to step back through the screens. Press ENTER when the correct screen appears.

### Efficiency

Efficiency is calculated as the ratio of Output Watts / Input Watts x 100 and can be viewed directly from the display. CFR units typically operate at an efficiency rate of about 95% which will vary slightly with load conditions.

### Battery Temperature

Displayed in degrees C, Ambient Temperature is measured inside the UPS in the vicinity of the battery compartment.



**Press CLEAR to return to SYSTEM PARAMETERS;  
Press CLEAR again to return to the OPENING MENU.**

### 3. OPERATION

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#### Input Parameters



"INPUT PARAMETERS" provides UPS Input Voltage, Current, Volt Amps, Power in Watts, Power Factor, and Line Frequency information. The main menu prompts you to select any of the six options by pressing the > arrow to advance through the various parameter screens; or < to step back through the screens. Press ENTER when the correct screen appears.

#### Voltage

The voltage measured at the input of the UPS (i.e., 208 VAC).

#### Current (optional)

The flow of current measured at the input of the UPS (i.e., 6.42 Amps).

#### Volt Amps (optional)

The apparent input power of the UPS calculated by multiplying input voltage by the input current (i.e., 1335 VA).

#### Power in Watts (optional)

The true input power of the UPS calculated in Watts (i.e., 1200 Watts).

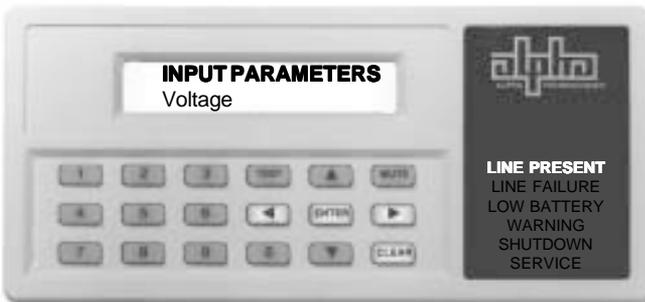
#### Power Factor

The ratio of true power (power actually consumed) to apparent power (simple product of voltage and current) at the input of the UPS (i.e., 0.89).

#### Line Frequency

The frequency of the AC Line measured at the input of the UPS (i.e., 60.02 HZ).

Note: Input Current, Input VA and Input Watts are optional on some units.



**Press CLEAR to return to INPUT PARAMETERS;**  
**Press CLEAR again to return to the OPENING MENU.**

## Output Parameters



"OUTPUT PARAMETERS" provides UPS Output Voltage, Current, Volt Amps, Power in Watts, Power Factor, and Line Frequency information. The main menu prompts you to select any of the six options by pressing the > arrow to advance through the various parameter screens; or < to step back through the screens. Press ENTER when the correct screen appears. Note: UPS's with dual outputs offer the option of selecting and viewing the VOLTAGE and CURRENT of each output individually.

### Voltage

Dual output voltages (OUTPUT 1 and OUTPUT 2) are displayed depending upon the particular user configuration (120 VAC or 208 / 240 VAC). This provides a reading for either single or dual outputs. For 120 VAC systems, use OUTPUT 1 readings; for 208 / 240 VAC systems, use OUTPUT 2 readings. For dual systems, use both OUTPUT 1 and OUTPUT 2 readings.

### Current

The flow of current measured at the output of the UPS provided for both OUTPUT 1 and OUTPUT 2 (see "Voltage" above).

### Volt Amps

The apparent output power of the UPS calculated by multiplying output voltage by the output current (i.e., 1335 VA).

### Power in Watts

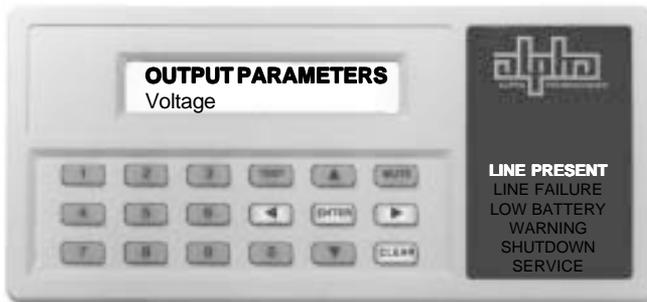
The true output power of the UPS calculated in Watts (i.e., 1200 Watts).

### Power Factor

The ratio of true power (power actually consumed) to apparent power (simple product of voltage and current) at the output of the UPS (i.e., 0.89).

### Line Frequency

The frequency of the AC Line measured at the output of the UPS (i.e., 60.02 HZ).



**Press CLEAR to return to OUTPUT PARAMETERS;  
Press CLEAR again to return to the OPENING MENU.**

### Battery Parameters



"BATTERY PARAMETERS" provides UPS Battery Voltage, Charger Current, and Charger Status information. The main menu prompts you to select any of the options by pressing the > arrow to advance through the various parameter screens; or < to step back through the screens. Press ENTER when the correct screen appears.

#### **Voltage**

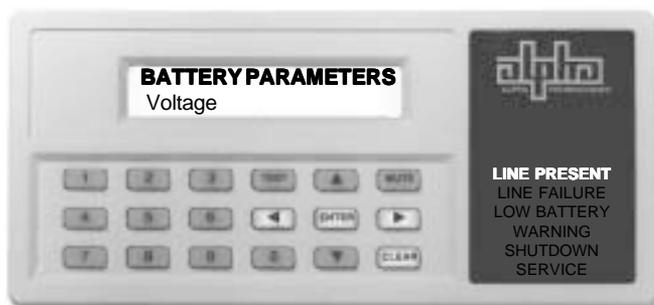
When the UPS is running in "LINE PRESENT" mode, the charger voltage is displayed (i.e., 27.4 VDC for 24 volt systems; 54.8 VDC for 48 volt systems). When the UPS is in "LINE FAILURE" mode, the voltage of the UPS batteries is measured under load (i.e., 23.5 VDC for 24 volt systems; 47.5 VDC for 48 volt systems) .

#### **Charger Current**

When the UPS is running in "LINE PRESENT" mode, the charger current is displayed (i.e., 2.1 Amps).

#### **Charger Status**

When the UPS is in "LINE PRESENT" mode, the charger keeps the batteries charged, indicated by the display "THE BATTERY CHARGER IS ON". When the UPS is in "LINE FAILURE" mode and running on the batteries, the charger is OFF, indicated by the display "THE BATTERY CHARGER IS OFF".



**Press CLEAR to return to BATTERY PARAMETERS;  
Press CLEAR again to return to the OPENING MENU.**

### User Parameters



"USER PARAMETERS" allows you to set the UPS time and date, enter the capacity of the batteries used in the UPS, and to change the security codes. When the USER PARAMETER screen is first accessed, you are prompted for a security code. Note: The code (1111) is pre-set at the factory and can be changed by entering the SET SECURITY CODE screen. After the code is correctly entered, the main menu prompts you to select any of the options by pressing the > arrow to advance through the various parameter screens; or < to step back through the screens. Press ENTER when the correct screen appears.



#### Set Time

Time is kept on a 24-hour clock (HH-MM-SS). Once this screen is entered, fields can be updated using the numbered keys on the keypad, or the up or down arrows to advance or decrement the entries. The first key pressed (number or arrow) will determine the available keys to complete the entry (see page 14).



#### Set Date

The date is kept on a 12-month calendar (MM-DD-YY). Once this screen is entered, fields can be updated using the numbered keys on the keypad, or the up or down arrows to advance or decrement the entries. The first key pressed (number or arrow) will determine the available keys to complete the entry (see page 14).



#### Set Test Schedule

The UPS can be setup to perform a routine self-test at intervals you specify. Once this screen is entered, you are prompted to enter specific test parameters from the available sub-menus.



#### Set Test Start Time

The start time is entered as described above, and is the time that will activate the self-test routine. Once this information is entered, you are prompted to enter the next set of test parameters.



#### Set Test Start Date

The start date is entered as described above. This establishes the earliest date that automatic self-test will first run.



#### Set Test Frequency (D, W, M)

The test frequency allows you to set the time interval between self-tests. The choices are DAILY, WEEKLY, MONTHLY, or OFF. Place the cursor over the selection you want and press ENTER to activate. Selecting OFF will disable the auto self-test function.



#### Set Test Duration

The test duration will set the length of time that the unit will perform its self-test. Select the duration by using the number keys to enter any value in the minutes field (from 00 to 15 minutes), and then the seconds field (from 00 to 59 seconds). The maximum time allowed for running the self-test is 15 minutes.

## User Parameters, *continued*



### Battery AH Capacity

Since the UPS can be equipped with many different types of batteries, it is important to enter the battery Amp Hour capacity (6.5 Ah; 7.2 Ah; 17 Ah; 33 Ah; or 55 Ah). Once this screen is entered, fields can be updated using the up or down arrows to advance or decrement the entries. Note: For information on the batteries used in the UPS, consult the specifications section of your CFR-UPS operator's manual.



### Set Key Click

The keypad can be configured to "click" whenever a key is pressed. The default is set to OFF.



### Set Master / Slave

When using two intelligent Interface Devices (one locally and the other remote), the one used most often should be configured as master; the other should be configured as slave.



### Set User/ History Security Code

The security code is used to restrict entry into certain areas of the program. The code (1111) is preset at the factory and allows access to USER PARAMETERS and HISTORY programs. The security code can be changed using the number keys on the keypad. **CAUTION: If the security code is changed and no record is kept, especially if the code becomes forgotten or lost, you will not be able to re-enter the program.**



### Display Unit Ident.

This screen is used to display vital information pertaining to the Intelligent Interface Device, the micro-controller board and the CFR's power board. This information is extremely useful for trouble-shooting and maintenance.

#### Display IID Ident.

Displays the software version and ID # of the Intelligent Interface Device (IID).

#### Display Micro Ident.

Displays the software version and serial # of the micro-controller board.

#### Display PwrBd. Ident.

Displays the EE Prom # and serial # of the CFR's power board.



### Set Comm. Port

This feature allows you to select the port for remote communications. In this display, you can select the RS-232, RS-485, or Modem port to configure. With the selection of any of these options, you will be guided through the complete setup of the communications port. Refer to your PC user's manual when making selections for a particular device. NOTE: The Comm Ports must be setup from the Intelligent Interface Device's keypad.

**Press CLEAR to return to USER PARAMETERS;  
Press CLEAR again to return to the OPENING MENU.**

## 3. OPERATION

---

### User Parameters, *continued*



#### Set Maintenance Security Code

The Maintenance Security Code is a second level of security and is used to gain access to the maintenance programs. The code can be changed using the number keys on the keypad. CAUTION: If the code is changed and no record is kept, especially if the code becomes forgotten or lost, you will not be able to re-enter the program. The factory default setting is 1111.



#### Set RS-232 Port

This menu selection will allow you to set the Baud Rate and Parity of the RS-232 port.



#### Set RS-232 Baud Rate

Select the proper baud rate for your communications device. The baud rates you can select for RS-232 are: 300, 600, 1200, 2400, 4800, and 9600.



#### Set RS-232 Parity

Select the proper parity for your communications device. The available choices are 8N1 (8 data bits, no parity, 1 stop bit); 7E1 (7 data bits, even parity, and 1 stop bit); and 7O1 (7 data bits, odd parity, and 1 stop bit).



#### Set Modem Port

Set Modem Port allows you to setup communications via an optional modem. You will be guided through a series of screens prompting you for the following information: set baud rate, set parity, auto dial configure, set telephone number, and set alarm triggers. Note: These selections are only available when a modem module is installed.



#### Set Modem Baud Rate

Select the proper baud rate for your modem. The baud rates you can select are: 300 and 1200.



#### Set Modem Parity

Select the proper parity for your modem. The available choices are 8N1 (8 data bits, no parity, 1 stop bit); 7E1 (7 data bits, even parity, and 1 stop bit); and 7O1 (7 data bits, odd parity, and 1 stop bit). Note: If you are using an alphanumeric pager, parity should be set to 7E1.



#### Auto Dial Configure

This feature allows you to setup a "call out" phone number to another modem. In this display, you have the option to dial out to a modem or digital pager (modem), an alphanumeric pager (pager), or to disable the autodial feature.

**User Parameters, *continued*****Set Phone Number**

This menu selection allows you enter the phone number that the modem will dial when an alarm condition occurs. The Intelligent Interface Device assumes that the phone number starts with "ATD". For numeric pagers, use commas (,) for time delay.

**Set Alarm Triggers**

This menu selection allows you to set from none to the maximum number of alarms available. You can scroll through the available alarms using the illuminated arrow keys and select either Y for Yes (notify), or N for No (do not notify). The selection is accomplished by toggling the display and pressing ENTER.

**Set RS-485 Port**

This menu allows you to setup the RS-485 port including setting the baud rate and parity of the communications device, and address of the Intelligent Interface Device. Note: If a modem is installed, this function is not available.

**Set RS-485 Baud Rate**

Select the proper baud rate for your communications device. The baud rates available for RS-485 are: 300, 600, 1200, 2400, 4800, and 9600.

**Set RS-485 Parity**

Select the proper parity for your communications device. The available choices are 8N1 (8 data bits, no parity, 1 stop bit); 7E1 (7 data bits, even parity, and 1 stop bit); and 7O1 (7 data bits, odd parity, and 1 stop bit).

**Set Address**

This menu allows you to set the address of the Intelligent Interface Device. The address can be from 1 to 99, but cannot duplicate the address of any other devices connected to the line.

**Set Alphanumeric Pager ID String**

This can only be done through the RS-232 or modem interface. The 7-digit pager ID string identifies which particular pager will be paged.

**Set Modem Message String**

This can only be done through the RS-232 or modem interface. The string (up to 80 characters) can be used to identify the location of the unit paging. The message is a header to the alarm information sent to the alphanumeric pager.

### History Logs



"HISTORY LOGS" allow you to review and clear the EVENT HISTORY files. These files are useful in keeping accurate records of ALARM conditions and the number of times the UPS has supported AC LINE FAILURES. When the HISTORY LOGS screen is first accessed, (and before history files are cleared), you are prompted for a security code. The code (1111) is pre-set at the factory and can be changed by entering the SET SECURITY CODE screen under the USER PARAMETERS menu. After the code is correctly entered, the main menu prompts you to select either option by pressing the > arrow to advance through the various parameter screens; or < to step back through the screens. Press ENTER when the correct screen appears.

#### View Event History



VIEW EVENT HISTORY displays each alarm condition according to type, date and time of occurrence (i.e., AC INPUT FAILURE 07-26-93 10:08:02). When an alarm condition is corrected, the change in status is also logged in the file.

#### Clear Event History



CLEAR EVENT HISTORY deletes all entries in the EVENT HISTORY file. A security code (1111) must be entered prior to clearing the file.

#### Date / Time Stamp (DTS)

Any event that causes the UPS to switch over to the LINE FAILURE operation such as a spike, sag, blackout, etc., will be recorded in the EVENT HISTORY log. Each log entry will be recorded along with a DATE / TIME STAMP.

#### Viewing Alarm Conditions

To view the various alarms, you must enter the VIEW EVENT HISTORY screen as described above. You can navigate through these alarms using the arrow keys. When you first enter the VIEW EVENT HISTORY screen, you will be displaying the last recorded alarm (by DATE / TIME STAMP). You can view the events for the currently displayed DTS or use the arrows to view past recorded events. The procedure is as follows:

- ▶ ARROW will scroll through the events, starting at the last event and working backward in time.
- ◀ ARROW will scroll from past events to the most recent.
- ◀ ARROW will scroll through events one-by-one in the current DTS.
- ▶ ARROW will jump to the last record in the current DTS.

**Press CLEAR to return to HISTORY LOGS.**  
**Press CLEAR again to return to the OPENING MENU.**

## Event Descriptions

There are a number of EVENTS that can be detected and recorded in the EVENT HISTORY log. Some of these conditions can be damaging to sensitive equipment, such as computers, resulting in data loss, system crashes, or equipment failure. The Alpha CFR UPS completely protects your equipment by responding to the following conditions:

**Low Battery Warning** - The batteries are near the end of their useful charge. If AC Line power is not restored within a short period of time, output power will be lost. All systems should be shutdown immediately to prevent loss of data.

**Low Battery Shutdown** - To prevent an over-discharge condition of the batteries, the unit has shutdown. Output power is terminated in this condition.

**Battery Voltage High** - The charging voltage is higher than the threshold setting for the batteries. This could be the result of a defective charger, improper external battery connections, or defective batteries. Service the unit or batteries to correct condition. Note: This condition activates the SERVICE alarm, along with an audible alarm which can be cleared by pressing the MUTE key.

**Battery Charger Current High** - The charger is outputting an excessive amount of current. This condition could be caused by defective batteries or improper external battery connections.

**Failed Self-Test** - The unit could not maintain output power while in the self-test mode. Check the batteries and circuit breakers. Note: This condition activates the SERVICE alarm, along with an audible alarm which can be cleared by pressing the MUTE key.

**Battery Fault** - The battery charger is not able to supply the proper amount of current or voltage to the batteries. This condition usually indicates that the batteries are not connected or the BATTERY circuit breaker is switched OFF.

**Glitch** - A glitch is a fast, low amplitude line disturbance where the input voltage drops momentarily. \*\*

**Spike** - A spike is a fast, high amplitude line disturbance where the input voltage rises momentarily. \*\*

**Sag** - A sag is a slow, low amplitude line disturbance where the input voltage decrease for a longer duration than a glitch. \*\*

**Surge** - A surge is a slow, high amplitude line disturbance where the input voltage increases for a longer duration than a spike. \*\*

**Brownout** - A brownout is a slow, low amplitude line disturbance where the input voltage decreases for a long period of time. \*\*

**Brownout High** - A brownout high (high overvoltage) is a slow, high amplitude line disturbance where the input voltage increases for a long period of time. \*\*

\*\* Indicates events that cause the UPS to operate in "LINE FAILURE" mode.

### 3. OPERATION

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#### Event Descriptions, *continued*

**Blackout** - A blackout is a complete loss of AC Line power. \*\*

**Frequency High** - A frequency high is a power line problem where the input frequency increases. \*\*

**Frequency Low** - A frequency low is a power line problem where the input frequency decreases. \*\*

**Output Voltage Low** - This is a warning that the output of the UPS is too heavily loaded. Reduce the load connected to the UPS.

**Output Voltage High** - This can be caused by the unit being out of calibration, or the unit is detecting an internal fault causing the overvoltage condition. Have the unit serviced by an authorized Alpha Repair Depot.

**Output Power Overload** - This is a condition where the output of the UPS is too heavily loaded. If this is not corrected, the unit may go into a shutdown condition to protect the UPS's internal circuitry.

**Output VA Overload** - This condition is also caused by the UPS being overloaded on the output. Reduce the load on the output of the UPS.

**Output Voltage Shutdown** - The UPS was overloaded and, to protect the internal circuitry, terminated the output to the load. Before restarting the UPS, remove nonessential equipment from the output and reduce the load.

**Output Short Circuit** - A load was connected to the UPS that was shorted. This could be caused by a miswired AC power cord or equipment connected to the UPS that is in need of repair. Note: This condition activates the SERVICE alarm, along with an audible alarm which can be cleared by pressing the MUTE key.

**Internal Temperature High** - The internal temperature of the UPS, measured by internal circuitry, was found to be too high. This could be caused by a sustained overload on the output of the UPS, a blocked fan (if equipped), or operating the unit in an excessively high ambient temperature. To prolong the life of the batteries and UPS components, determine and correct the cause of the overtemperature condition.

**Input Line Fail** - The UPS switched to backup power to protect the equipment for one (or more) of the above conditions. \*\*

**Normal Line Mode** - Indicates that the UPS is operating on, or has switched back to, normal AC Line power.

**Test Mode** - Indicates the UPS was put into a test mode condition either by the TEST SCHEDULE routine or by pressing the TEST button on the Intelligent Interface Device's panel. The unit will switch to backup power while in the test mode. \*\*

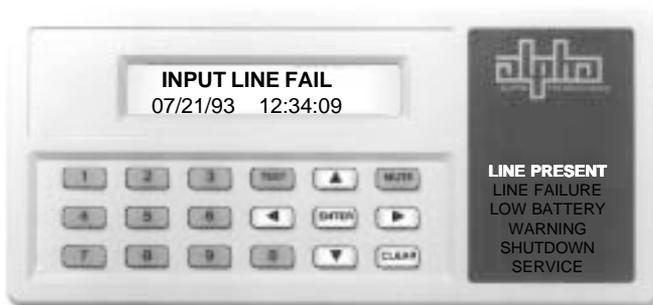
\*\* Indicates events that cause the UPS to operate in "LINE FAILURE" mode.

#### Event Descriptions, *continued*

**Equalize Charge Mode** - Indicates that the battery charger was switched into the equalize mode. This mode is automatically enabled after the UPS has operated in the backup function, and serves to ensure that the batteries are optimized (all at the same potential).

**Float Charge Mode** - This is the normal operating mode of the battery charger. During LINE PRESENT operation, the batteries constantly receive a "Float" charge voltage to ensure that backup power is available when required.

**Service Codes (1-6)** - These codes indicate a potential fault within the UPS. Call Alpha Customer Support and report any Service Codes recorded in the EVENT HISTORY log.



**History Log Display of Events**  
Use arrow keys to view, clear key to back out.

#### Maintenance Parameters



"MAINTENANCE PARAMETERS" allow you to customize UPS detection and warning characteristics. Normally, there should be no need to change these factory settings. Once the correct security code has been entered, the fields can be altered by using the < arrow to decrease the setting, or the > arrow to increase the setting. The bar type display is arranged for a total of 16 different setting levels, and can be set for any value between 1 and 16. If a setting is changed, it can easily be reset to the factory default by placing the cursor over the special character in the bar type chart and pressing ENTER.



#### **Fast Detect Lo Ref**

Changing this value will alter the characteristics of how the UPS responds to a fast, low amplitude line disturbance (glitch).



#### **Fast Detect Hi Ref**

Changing this value will alter the characteristics of how the UPS responds to a fast, high amplitude line disturbance (spike).



#### **Medium Detect Lo Ref**

Changing this value will alter the characteristics of how the UPS responds to a slow, low amplitude line disturbance (sag).



#### **Medium Detect Hi Ref**

Changing this value will alter the characteristics of how the UPS responds to a slow, high amplitude line disturbance (surge).



#### **Slow Detect Lo Ref**

Changing this value will alter the characteristics of how the UPS responds to a slow, low amplitude line disturbance (brownout).



#### **Slow Detect Hi Ref**

Changing this value will alter the characteristics of how the UPS responds to a slow, high amplitude line disturbance (high brownout or sustained overvoltage).



#### **Slow Detect Hys Lo Ref**

Changing this value will alter the characteristics of the voltage level at which the UPS will resume LINE POWER operation after a brownout condition has been corrected.



#### **Slow Detect Hys Hi Ref**

Changing this value will alter the characteristics of the voltage level at which the UPS will resume LINE POWER operation after an overvoltage condition has been corrected.

**Maintenance Parameters, *continued***



**Max. PLL Slew Rate**

Changing this value will alter the characteristics of how the Phase Locked Loop responds when the CFR UPS resumes LINE PRESENT operation after a line fault has been corrected.



**Battery Warning Ref**

Changing this value will alter the time before a LOW BATTERY WARNING occurs. Decreasing this value will allow the batteries to drain more of their charge before a warning is given. Increasing this value will allow more run time between LOW BATTERY WARNING and SHUTDOWN.



**Maintenance Parameters Display. Note the number of digits selected corresponds to the number to the right of the display.**

**Service Parameters**

"SERVICE PARAMETERS" allows changes to the AC LINE detect parameters. Since these parameters are pre-set at the factory and calculated for optimum sensing, access to the various fields is restricted to factory service technicians. Prior to accessing any section of this portion of the program, contact Alpha Technologies for instructions and a password.



**Press CLEAR to return to ALPHA TECHNOLOGIES default screen; Press CLEAR again to return to the OPENING MENU.**

## 4. ALARMS

### Low Battery Warning

LOW BATTERY WARNING, indicated by the "LOW BATTERY" and "WARNING" displays, precedes LOW BATTERY SHUTDOWN. It indicates that the batteries are approaching full discharge and that the load can no longer be supported. Immediate steps should be taken to protect the load or begin a smooth shutdown of all loads connected to the UPS.

### Low Battery Shutdown

LOW BATTERY SHUTDOWN, indicated by the "LOW BATTERY," "WARNING" and "SHUTDOWN" displays, has the highest priority. This indicates that the UPS was no longer able to support the load from battery power and shutdown to prevent over-discharge damage to the batteries. If an additional source of power (such as a generator) is available, it should be used until AC Line power returns.

Alarms are displayed as they occur and are determined by their effect on the continuing operation of the UPS. Alarms will continue to be displayed until the condition has been corrected. In addition, an audible alarm will sound to indicate the presence of an alarm condition. Audible alarms can be cancelled by pressing the keypad's MUTE key.



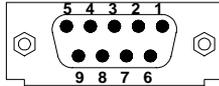
**LOW BATTERY WARNING**



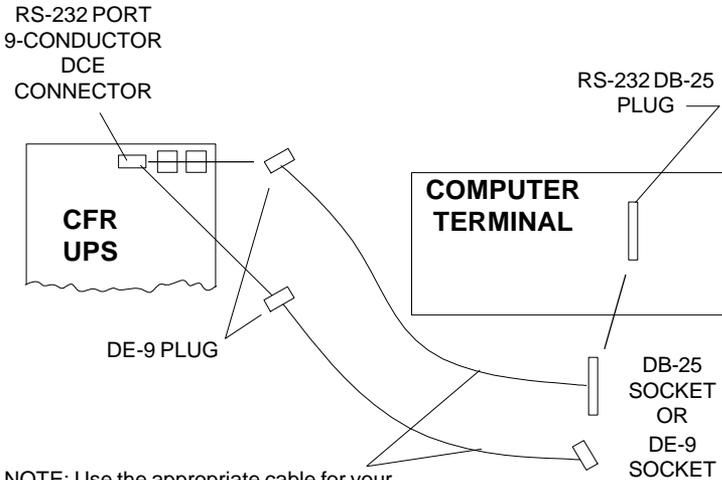
**LOW BATTERY SHUTDOWN**

### RS-232

The UPS can be remotely setup, monitored, and tested using a PC's RS-232 serial port. RS-232 remote operation is accomplished by connecting the UPS's rear panel DCE connector to the computer's serial port. To the connected terminal or PC, the UPS will look and act like a modem. This allows easy communication across a Local Area Network using modem sharing software which is available for all networks. To configure the UPS for RS-232 communication, refer to SET COMM PORT RS-232 in Section 3. Note: For RS-232 pinout and wiring configurations see Section 7 "Serial Operation Standards".



DCE Connector for RS-232 Serial Operation



NOTE: Use the appropriate cable for your computer, DB-25, or the DE-9 socket. See Section 7 for additional information.

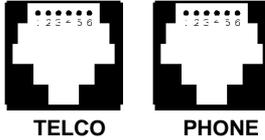
RS-232 Connection Detail

## 5. COMMUNICATION INTERFACE OPTIONS

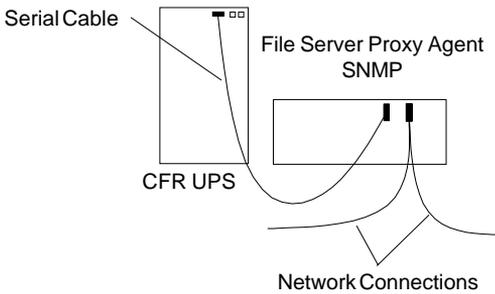
### RS-485 Serial Operation

RS-485 is standard with the Intelligent Interface Device and will allow the UPS to be used in high speed, differential mode, multidrop communications applications. Connection is made to the PC terminal or LAN via either of the RJ-11 jacks located on the back of the UPS.

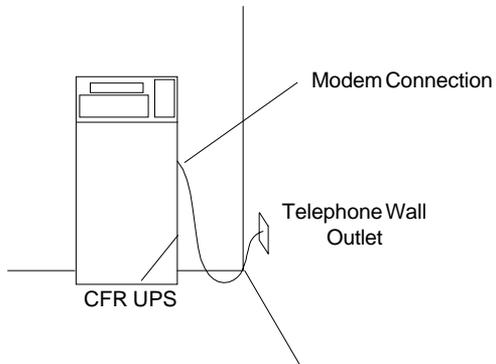
To configure the UPS for RS-485 communication, refer to the SET RS-485 PORT in Section 3 "User's Parameters".



**RJ-11 Connectors**  
(used in RS-485 or modem applications)



**UPS / LAN System Configuration**



**UPS Modem Installation**

### Modem Installation (optional)

The Intelligent Interface Device can be equipped with an optional modem to provide long-range communications. Note: Installing the modem will disable the RS-485 port.

To install the modem, you must first remove the CFR UPS's front panel (page 9) to access the Intelligent Interface Device. Carefully plug the modem module into the empty sockets as indicated (see component layout drawing on page 11). Check that all of the legs on the module are properly seated into the sockets. Note: It may be necessary to remove the RS-485 IC (label U3) from the circuit board before installing the modem module. Upgrade EPROM (U16) to a modem compatible version.

Once the modem module is installed, connect a standard modular telephone cable, to the jack labeled "TELCO" to the telephone wall jack. A second jack labeled "PHONE" allows reconnection of the telephone equipment that may have been removed when the UPS was added. The modem module installation is complete and ready for operation. To configure the modem, see SET MODEM PORT (Section 3 "User Parameters").

### Modem Operation

In order to use the modem, you must first enter the phone number and alarm parameters you wish to monitor into the Intelligent Interface Device. This is accomplished under the USER PARAMETERS screen. You will be prompted to enter the phone number of the modem you want alerted and to select the alarms that will initiate the call. Alarms that are not selected will be disregarded (but still recorded in the EVENT HISTORY log). When a selected alarm occurs, the Intelligent Interface Device will notify you, (via the modem), at which time the alarms can be viewed on the terminal. To determine the state of a call in progress, the following cryptic letters appear in the upper-right corner of the Intelligent Interface Device's "Default" screen.

### Diagnostic Codes for Pager and Modem

- b - trigger(s) occurred (not detected or completed yet)
- c - valid connection to modem (carrier detected)
- d - off hook but no carrier detect (dialing)
- 1 - waiting for "ID=" from pager BBS
- 2 - waiting for "<esc>[p" from pager BBS
- 3 - waiting for message acknowledged
- 4 - unknown response from paging system after block sent. Set flags to repage.
- 5 - got ACK. Wait till hang up. Good page.
- 6 - got RS. Wait till hang up. Call again.

Note: Access to the MODEM setup is restricted and can only be accessed by entering the security code (1111). Baud, parity, and triggers must be setup using the front panel keypad. Alphanumeric setup must be done through a remote terminal (RS-232 or modem). You may also dial into the Intelligent Interface Device's modem to interrogate the unit.

## 5. COMMUNICATION INTERFACE OPTIONS

### Remote Communications Operation



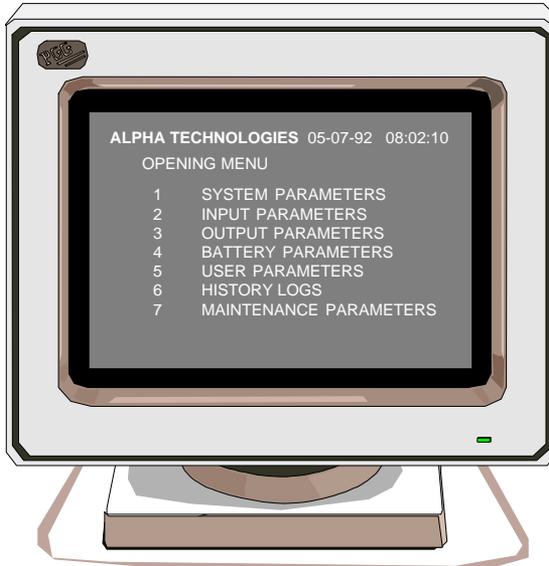
1. You can directly access the Intelligent Interface Device by typing the number associated with the desired function on the PC keyboard and pressing ENTER (see illustration below). As an example, typing a "1" and pressing the ENTER key will display the SYSTEM PARAMETERS screen. The OPENING MENU command icons are displayed in the margins throughout the manual.



2. Selecting a menu function will take you to another level of menus where additional selections can be made. As an example, the USER PARAMETERS feature has many options. Pressing "5" ENTER will lead you to a list of the available user parameters. Selecting a number from the list, such as "53" ENTER, the "Test Start Date" screen will appear.

*Short cut tip* - All of the sub-menu features can be accessed using a one-step command by directly entering the number associated with that feature. From any display that you may be in, you can access the desired function. This technique bypasses the selection of options from the OPENING MENU screen. Icon numbers are displayed in the margins of this manual.

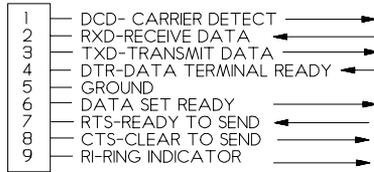
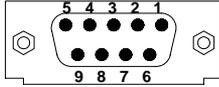
Note: See "How To Use This Manual" (page 1) for additional icon information.



To display the System Parameters screen, type "1" and press ENTER.

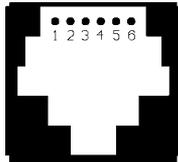
## 5. COMMUNICATION INTERFACE OPTIONS

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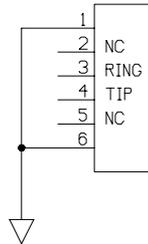


### RS-232 Connections

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RJ-11 Connector



### Communication Pinouts

## 6. MAINTENANCE

---

### Repair Instructions

Before returning a unit to Alpha Technologies for repair, a Return Material Authorization (RMA) should first be obtained from Alpha's Customer Service Department. The RMA number should be clearly marked on the unit's original shipping container. If the original container is no longer available, the unit should be packed with at least 3 inches of shock-absorbent material. Note: Do not use popcorn-type packing material. Returns should be prepaid and insured (COD and freight collect can not be accepted).

ALPHA TECHNOLOGIES DOES NOT ASSUME RESPONSIBILITY FOR DAMAGE CAUSED BY THE IMPROPER PACKAGING OF RETURNED UNITS.

### Parts and Ordering Instructions

To order parts, contact the Alpha Technologies Customer Service Department directly at:

United States	(206) 647-2360
Canada	(604) 430-1476
United Kingdom	44-279-422110
Germany	49-9122-997303
Middle East	357-5-375675

**TO OBTAIN COMPLETE TECHNICAL SUPPORT  
(7 DAYS / WEEK, 24 HOURS / DAY)  
CALL**

**1 - 8 0 0 - 3 2 A L P H A  
(USA)**

**1 - 8 0 0 - 6 6 S U R G E  
(Canada)**

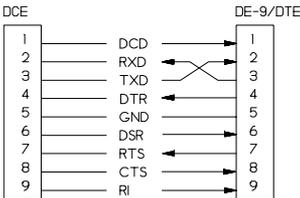
**Specifications**

Operating Temp	32° -104° F / 0° - 40°C
Indicators	Line Present, Line Failure, Low Battery Shutdown,
Controls	Low Battery Warning, and Service Test, Alarm OFF (MUTE), Numeric Keypad
Connectors	DE-9 (RS-232), RJ-11 (RS-485)
Audible Alarms	Line Failure, Low Battery Warning
Dimensions	7.4"W x 3.5"H x 2"D (188mm x 89mm x 51mm)
Weight	1.5 lbs. (0.7 kg)

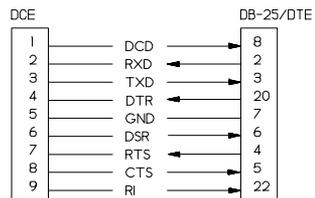
Specifications subject to change without notice.

**Serial Operation Standards**

Parameter	RS-232	RS-485
Mode of operation	Single-ended	Differential
Number of drivers and receivers allowed	1 driver 1 receiver	32 drivers 32 receivers
Maximum cable length (ft)	50	4000
Maximum data rate bits-per second	20K	10M
Maximum common-mode voltage	± 25 V	12 V / -7 V
Driver output	± 5 V min. ± 15 V max.	± 1.5 V min.
Driver slew rate	30 V/u S max.	NA
Driver output short circuit / current limit	500 mA to VCC or GND	150 mA to GND 250 mA to -8 V or 12 V
Driver output resistance (High Z state)	Power-ON	120K ohms
	Power-OFF	120K ohms
Receiver input resistance	3K - 7K ohms	12K ohms
Receiver sensitivity	± 3 V	± 200 mV



**DCE to DE-9  
Wiring Diagram**



**DCE to DB-25  
Wiring Diagram**

## Remote Terminal Quick Reference

The menu items outlined in this manual can be accessed by pressing the keys on the keypad of the Intelligent Interface Device, or from a remote terminal. The numbers contained in this guide will act as a quick reference to accessing menu functions. Single-digit numbers relate to specific main menus. Double-digit numbers relate to specific sub-menus.

- 1    SYSTEM PARAMETERS**
  - EFFICIENCY
  - BATTERY TEMPERATURE
  - 11**    START TEST
  - 12**    STOP TEST
  
- 2    INPUT PARAMETERS**
  - VOLTAGE
  - CURRENT
  - VOLT AMPS
  - POWER IN WATTS
  - POWER FACTOR
  - LINE FREQUENCY
  
- 3    OUTPUT PARAMETERS**
  - VOLTAGE
  - CURRENT
  - VOLT AMPS
  - POWER IN WATTS
  - POWER FACTOR
  - LINE FREQUENCY
  
- 4    BATTERY PARAMETERS**
  - 41**    VOLTAGE
  - 42**    CHARGER CURRENT
  - 43**    CHARGER STATUS
  
- 5    USER PARAMETERS**
  - 51**    SET TIME
  - 52**    SET DATE
    - SET TEST SCHEDULE
  - 53**    SET TEST START TIME
  - 54**    SET TEST START DATE
  - 55**    SET TEST FREQUENCY
  - 56**    SET TEST DURATION
  - 57**    BATTERY AH CAPACITY
  - 58**    SET USER / HISTORY SECURITY CODE
  - 59**    SET MAINTENANCE SECURITY CODE
    - ID SOFTWARE VER.      CFR SOFTWARE VER.
    - MICROBD SER. NO.      EEPROM VERSION NO.
    - POWERBD SER. NO.      IID SERIAL NO.
  - 501**    SET MODEM PHONE NUMBER (ATDT18003225742)
  - 502**    SET PAGER ID STRING (7589210)
  - 503**    SET MODEM MESSAGE STRING
  
- 6    HISTORY LOGS**
  - 61**    DISPLAY EVENT HISTORY
  - 62**    CLEAR EVENT HISTORY
  
- 7    MAINTENANCE PARAMETERS**
  - 70**    FAST DETECT LO REF
  - 71**    FAST DETECT HI REF
  - 72**    MEDIUM DETECT LO REF
  - 73**    MEDIUM DETECT HI REF
  - 74**    SLOW DETECT LO REF
  - 75**    SLOW DETECT HI REF
  - 76**    SLOW DETECT HYS LO REF
  - 77**    SLOW DETECT HYS HI REF
  - 78**    MAX. PLL SLEW RATE
  - 79**    BATTERY WARNING REF.

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**Addendum**

**The Intelligent Interface Device**

---

**COMPLETE THE FOLLOWING FOR YOUR RECORDS:**

Interface ID # \_\_\_\_\_  
Software Version \_\_\_\_\_  
Options (i.e., modem) \_\_\_\_\_  
Purchase date \_\_\_\_\_

**THIS UNIT WAS PURCHASED FROM:**

Dealer name \_\_\_\_\_  
City \_\_\_\_\_  
State/Province \_\_\_\_\_  
Zip/Postal Code \_\_\_\_\_  
Country \_\_\_\_\_  
Telephone # \_\_\_\_\_

**RETURN THE ENCLOSED  
WARRANTY CARD  
TO ALPHA TECHNOLOGIES**

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► **USA, LATIN AMERICA  
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Alpha Technologies  
3767 Alpha Way  
Bellingham, WA 98226  
Tel: (360) 647-2360  
Fax: (360) 671-4936

► **CANADA**

Alpha Technologies  
7033 Antrim Ave.  
Burnaby, BC, V5J 4M5  
Tel: (604) 430-1476  
Fax: (604) 430-8908

► **UNITED KINGDOM,  
EUROPE AND AFRICA**

Alpha Technologies  
Cartel Business Estate  
Edinburgh Way  
Harlow, Essex CM20 2DU  
Tel: +44-1279-422110  
Fax: +44-1279-423355

► **GERMANY**

Alpha Technologies  
Hansastrasse 8  
D-91126 Schwabach  
Tel: +49-9122-997303  
Fax: +49-9122-997321

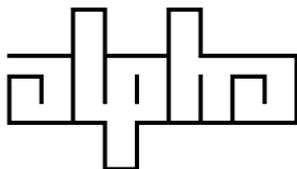
► **MIDDLE EAST**

Alphatec  
P.O. Box 6468  
3307 Limassol, Cyprus  
Tel: +357-5-375675  
Fax: +357-5-359595

► **AUSTRALIA**

Alpha Technologies  
8 Anella Ave., Unit 6  
Castle Hill, NSW 2154  
Tel: +61 (0)2 894-7866  
Fax: +61(0)2 894-0234

<http://www.alpha-us.com>



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