



ME-ARC

Remote Control



Owner's Manual
(for Revision 2.1 or higher)

Disclaimer of Liability

Since the use of this manual and the conditions or methods of installation, operation, use and maintenance of the ME-ARC are beyond the control of Magnum Energy Inc., this company does not assume responsibility and expressly disclaims liability for loss, damage or expense, whether direct, indirect, consequential or incidental, arising out of or anyway connected with such installation, operation, use, or maintenance.

Due to continuous improvements and product updates, the images shown in this manual may not exactly match the unit purchased.

Restrictions on Use

The ME-ARC remote shall not be used in connection with life support systems, life saving or other medical equipment or devices. Using the ME-ARC with this particular equipment is at your own risk.

Important Product Safety Instructions

This manual contains important safety instructions that must be followed during the installation and operation of this product. Read all instructions and safety information contained in this manual before installing or using this product.

- All electrical work must be performed in accordance with local, state and federal electrical codes.
- This product is designed for indoor / compartment installation. It must not be exposed to rain, snow, moisture or liquids of any type.
- Use insulated tools to reduce the chance of electrical shock or accidental short circuits.
- Remove all jewelry such as rings, watches, bracelets, etc., when installing or performing maintenance on the inverter.
- Always disconnect the batteries or energy source prior to installing or performing maintenance on the inverter. Live power may be present at more than one point since an inverter utilizes both batteries and AC. Turning off the inverter may not reduce this risk. As long as AC power is connected, it will pass thru the inverter regardless of the power switch on the inverter or the ON/OFF INVERTER button on the remote.

Safety Symbols

To reduce the risk of electrical shock, fire, or other safety hazard, the following safety symbols have been placed throughout this manual to indicate dangerous and important safety instructions.



WARNING: This symbol indicates that failure to take a specified action could result in physical harm to the user.



CAUTION: This symbol indicates that failure to take a specified action could result in damage to the equipment.



Info: This symbol indicates information that emphasizes or supplements important points of the main text.



Remedy: This symbol provides possible solutions for related issues.

Table of Contents

1.0 Overview	1
2.0 Installation	2
2.1 Installation Guidelines	2
2.2 Tools Required	2
2.3 Flush Mount Installation Procedure	2
2.4 Bezel Mount Installation Procedure	3
2.5 Power-up Routine.....	4
3.0 Setup	5
3.1 Navigating the Remote's Menu	5
3.2 Pushbuttons and Menu Items.....	7
3.2.1 FAVS Button.....	7
3.2.2 CTRL (Control) Button	9
01 ACIn Control	10
02 CHG (Charge) Control.....	10
03 GEN Control	11
3.2.3 METER Button	13
02 AC Meters	14
03 AGS Meters.....	14
04 BMK Meters.....	16
3.2.4 SETUP Button	18
01 Remote Setup	19
02 Invert Setup	20
03 Charger Setup	23
04 AGS Setup	29
05 BMK Setup.....	30
3.2.5 TECH Button	30
4.0 Menu Map: Section 1-4	34-37
5.0 Operation	38
5.1 Front Panel	38
5.1.1 LED Indicators.....	38
5.1.2 LCD Display	38
5.1.3 ON/OFF Pushbuttons.....	39
5.1.4 Menu Pushbuttons	39
5.1.5 Rotary SELECT Knob	39
5.2 Operating the Inverter/Charger.....	40
5.2.1 Inverter Mode	40
5.2.2 Charger Mode	40
5.3 System Status Messages.....	41
5.3.1 Inverter Mode Messages	41
5.3.2 Charger Mode Messages.....	42
5.3.3 Fault Mode Messages	47
5.3.3.1 System Fault Messages	47
5.3.3.2 Stacking Fault Messages	52
5.3.3.3 Internal Fault Messages	53
5.3.4 LED Indicator Guide	54
6.0 Troubleshooting	55
6.1 Troubleshooting Tips.....	56
6.1.1 Inverter Problems	56
6.1.2 Charger Problems	56
6.2 Performing an Inverter Reset.....	57
6.3 Powering Down the Inverter	57
7.0 Limited Warranty	58

List of Figures

Figure 1-1, Front Panel Features	1
Figure 2-1, Remote Cutout Dimensions.....	3
Figure 2-2, Remote Bezel Dimensions	3
Figure 2-3, Remote Control Connections	4
Figure 2-4, Power Up Routine	4
Figure 3-1, Front Panel Set-up Features.....	5
Figure 3-2, SETUP Menu Navigation	6
Figure 3-3, FAVS Button	8
Figure 3-4, CTRL Button	9
Figure 3-5, Meter Button	12
Figure 3-6, Setup Button	18
Figure 3-7, TECH Button.....	30
Figure 4-1, Inverter/Charger Menu Map (Pages 1 - 4).....	34-37
Figure 5-1, ME-ARC Front Panel Controls and Indicators.....	38
Figure 5-2 to 5-5, Inverter Modes	41-42
Figure 5-6 to 5-15, Charging Modes	42-46
Figure 5-16, Low Battery Fault	47
Figure 5-17, High Battery Fault	47
Figure 5-18, Overtemp Fault	48
Figure 5-19, AC Overload Fault.....	48
Figure 5-20, AC Backfeed Fault.....	48
Figure 5-21, High Volts AC Fault	49
Figure 5-22, Dead Battery charge Fault	49
Figure 5-23, Overcurrent Fault	49
Figure 5-24, FET Overload Fault.....	50
Figure 5-25, Breaker Tripped Fault	50
Figure 5-26, Unknown Fault	50
Figure 5-27, Tfmr Overtemp Fault.....	51
Figure 5-28, Fatal Error \$ Fault.....	51
Figure 5-29, No Inverter Comm.....	51
Figure 5-30, StackClock Fault.....	52
Figure 5-31, Stack Mode Fault.....	52
Figure 5-32, StackPhase Fault	52
Figure 5-33, Internal Bridge Fault	53
Figure 5-34, Internal Charger Fault	53
Figure 5-35, Internal NTC Fault	53
Figure 5-36, Internal Relay Fault	53
Figure 6-1, Performing an Inverter Reset	57

List of Tables

Table 3-3, Battery Type to Charge Voltages	24
Table 5-1, LED Indicator Guide	54
Table 6-1, Remote Control Troubleshooting Guide	55

1.0 Overview

The ME-ARC remote control allows you to monitor and customize the operating parameters for your Magnum inverter/charger. It is the same remote used on all Magnum inverter/charger models in the ME, MM, MS, MS-AE, MS-PAE and RD Series lines so there is no cross-platform confusion.

The ME-ARC50 comes standard with a 50 foot, 4-conductor (twisted-pair) telephone cable and includes non-volatile memory (preserves adjustable settings, even if power to the remote or inverter is removed). The Magnum remote control includes all of the programming and operation functions included in an easy-to-use package.



Info: This manual is for the ME-ARC with revision 2.1 or higher; see the *TECH: 02 Revisions* display on page 16 for information on how to determine your revision level.



Figure 1-1, Front Panel Features

The ME-ARC is equipped with the following features:

- **LED Indicators** - The at-a-glance LEDs provide the inverter/charger status in a straightforward way.
- **LCD Display** - The LCD display is a 16 x 2 line (32 characters total), alphanumeric display used for setting up the inverter/charger operation, as well as viewing current status or fault messages.
- **ON/OFF Pushbuttons (x2)** - Allows the inverter or charger to be independently and quickly enabled or disabled.
- **Menu Pushbuttons (x5)** - The menu pushbuttons allow the inverter or charger to be configured to your specific system preferences. These menus also allow simple access to menu items that can help with monitoring and troubleshooting your inverter/charger system.
- **Rotary Knob / SELECT button** - The rotary encoder knob is similar to a dash radio knob and is used to quickly scroll through and select various menu items and settings. Pushing this rotary knob allows you to "SELECT" a menu item, or to "Save" a setting once it is displayed on the LCD screen.

2.0 Installation

2.0 Installation

Before installing the remote, read the entire installation section to determine how you are going to install your ME-ARC. The more thorough you plan in the beginning, the better your inverter needs will be met.



Info: Installations should be performed by qualified personnel, such as a licensed or certified electrician. It is the installer's responsibility to determine which safety codes apply and to ensure that all applicable installation requirements are followed. Applicable installation codes vary depending on the specific location and application.



Info: Review the "Important Product Safety Information" on the front inside cover page before any installation.

2.1 Installation Guidelines

- Before connecting any wires, determine the remote cable route throughout the home or vehicle/boat, both to and from the inverter.
- Always check for existing electrical, plumbing or other areas of potential damage BEFORE drilling or cutting into walls to mount the remote.
- Make sure all wires have a smooth bend radius and do not become kinked.
- If installing this remote in a boat, RV or truck; ensure the conductors passing through walls, bulkheads or other structural members are protected to minimize insulation damage such as chafing, which can be caused by vibration or constant rubbing.

2.2 Tools Required

Installing the remote control is a simple process and requires the following tools:

- Phillips screwdriver
- Level
- Drill
- Cut-out tool (knife/saw)
- Pencil
- Drill bit (7/64")

2.3 Flush Mount Installation Procedure

1. Select an appropriate location to install the remote control. Allow ample room to access the remote's adjustment dial and to view the LEDs. Ensure the viewing angle of the display is appropriate.
2. Refer to Figure 2-1 for hole and cutout dimensions.
3. Run the remote cable between the remote and the inverter/charger. This cable is a 4-wire, twisted-pair, telephony standard with RJ11 connectors on each end. A standard telephone cable may be substituted if the provided remote cable is not able to be used.
4. Connect the remote cable into the RJ11 "Remote" port (has blue label) on the inverter/charger (see Figure 2-3).
5. Have the inverter connected to batteries, but ensure the inverter is off and that no AC power is connected to the inverter.

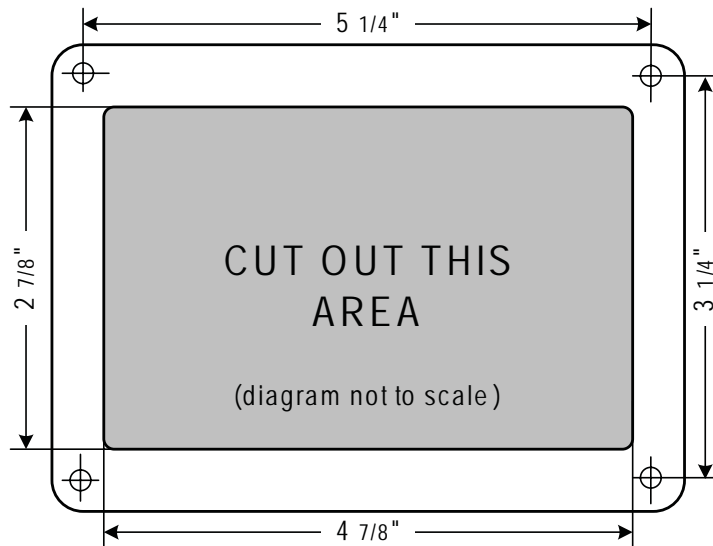


Figure 2-1, Remote Cutout Dimensions

2.4 Bezel Mount Installation Procedure

1. Select an appropriate location to install the remote control. Allow ample room to access the remote's adjustment dial and to view the LEDs. Ensure the viewing angle of the display is appropriate.
2. Refer to Figure 2-2 for mounting dimensions. Use the 3 1/4 x 5 1/4 dimensions for mounting the bezel. Mount the remote to the bezel and run the cable through the notch or out the back of the bezel for best mounting.
3. Run the remote cable between the remote and the inverter/charger. This cable is a 4-wire, twisted-pair, telephony standard with RJ11 connectors on each end. A standard telephone cable may be substituted if the provided remote cable is not able to be used.
4. Connect the remote cable into the RJ11 "Remote" port (has blue label) on the inverter/charger (see Figure 2-3).
5. Have the inverter connected to batteries, but ensure the inverter is off and that no AC power is connected to the inverter.

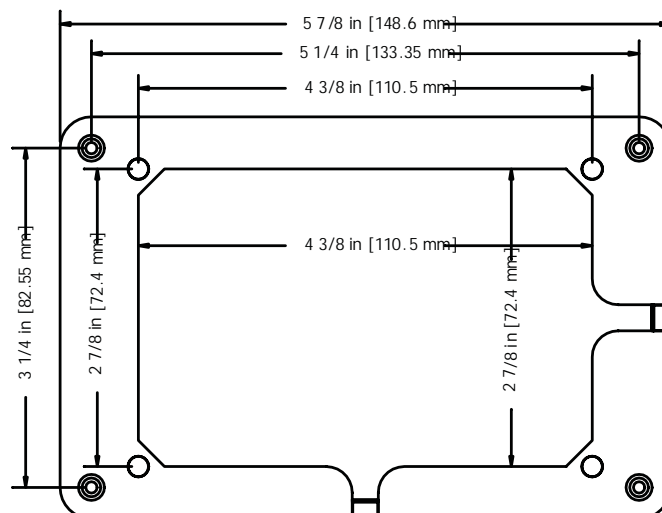


Figure 2-2, Remote Bezel Dimensions

2.0 Installation



Info: All power to operate the remote control is provided by the inverter/charger through the remote cable.

6. While monitoring the front of the remote, connect the other end of the cable into the RJ11 jack on the backside of the remote (see Figure 2-3).
7. Immediately upon connecting the remote cable, all the LED's will come on as the unit goes through a self-test. After the initial self-test completes, text should appear with a system status message indicating the current state of the inverter/charger. If not, please refer to the troubleshooting section.
8. Secure the remote to the wall using the four 6 x 3/4" screws provided.
9. The remote is ready for setup.

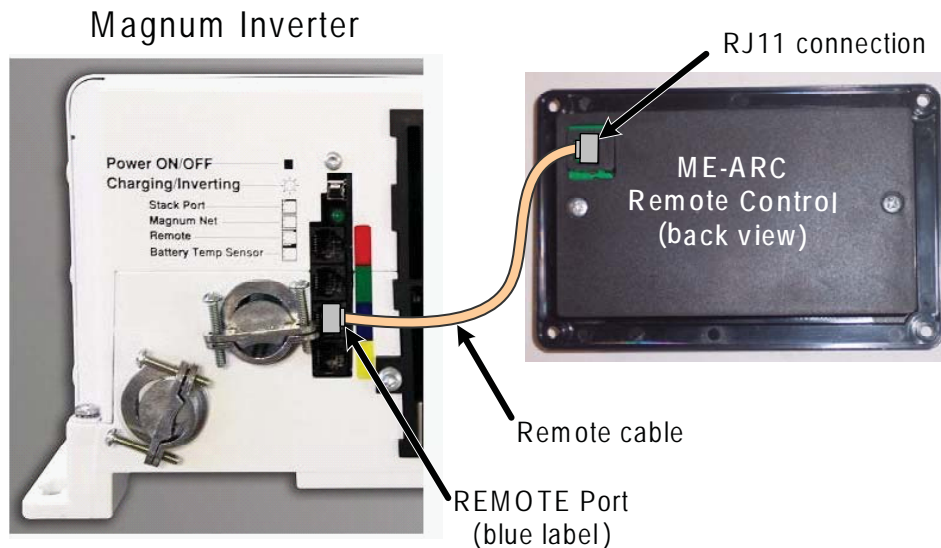


Figure 2-3, Remote Control Connections

2.5 Power-up Routine

- **Power up Routine:** When the ME-ARC is first connected to the inverter a power up routine is initialized. During the power up routine the LCD will read: Magnum Energy, Self Test, (C) 2009, Connecting to..., ME-ARC V #.#, INV/CHG V #.#.

After the initial power up routine is finished the remote will be displaying "Set Clock".

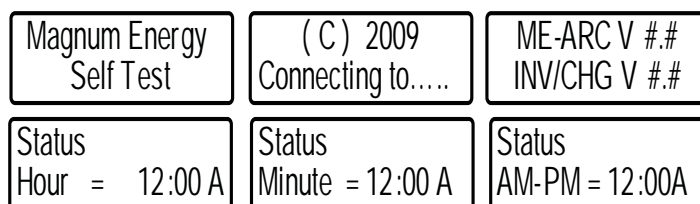


Figure 2-4, Power Up Routine

3.0 Setup

When the remote is connected to a Magnum inverter/charger, the settings in the remote control determine the inverter/charger operating parameters. The default settings in the remote control (see Table 3-4, Inverter/Charger Default Settings) are adequate for most installations, however you have the option to change some of the operating parameters if required. This section will show you how to navigate the remote, give you an understanding of the function of each adjustable setting, and help you decide what setting should be used.

3.1 Navigating the Remote's Menu

The ME-ARC has an internal structure that provides menu items and adjustable settings that provide the ability to configure your inverter/charger to your specific parameters.



Info: See Figure 4-1, *Inverter/Charger Menu Map* for a complete map of the inverter/charger menu items and adjustable settings.

Familiarize yourself with the items on the front panel which are used to find, adjust and save the desired setting. They are:

- **LCD Display** - The bottom line of the LCD display shows the menu items, adjustable settings, or the meters display information.



Info: The bottom line of the LCD display returns to the Home Screen to show DC voltage and current (see *Figure 3-1*) after 5 minutes - if no buttons have been pressed.



Info: When the "←" (left facing arrow) symbol is shown on the display it indicates that the displayed setting has been selected and will be used.

- **Menu Pushbuttons (x5)** - These five buttons allow simple access to the menu items that can help with configuring, monitoring and troubleshooting your inverter/charger system.
- **Rotary SELECT Knob** - This knob allows you to quickly scroll through and select various menu items and settings. Pushing on the knob selects the menu item to change or saves this current selection. Refresh the LCD display by holding this knob down for 7 seconds.

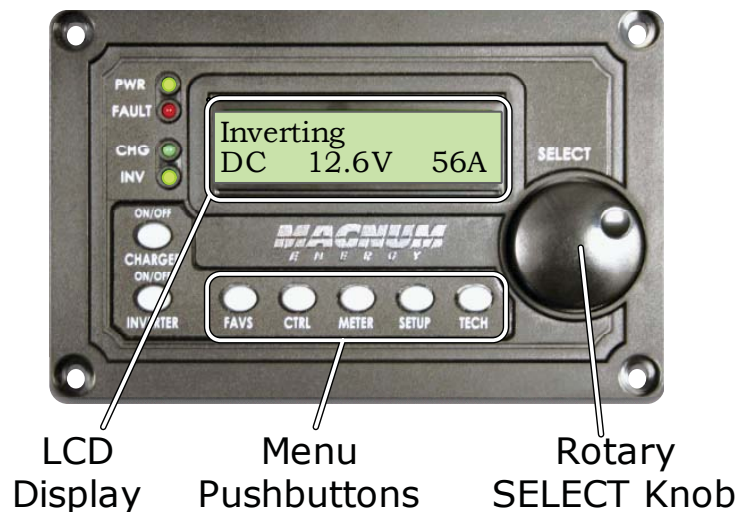
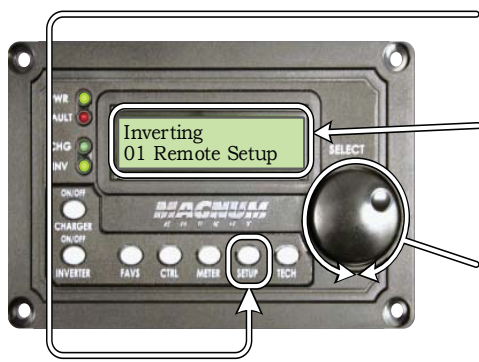


Figure 3-1, Front Panel Set-up Features

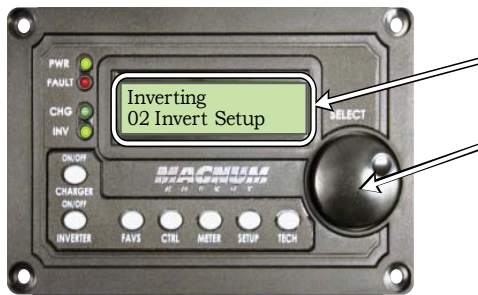
3.0 Setup



1. Press the SETUP Menu button .

Bottom line shows a menu heading.

2. Turn the SELECT knob to the desired menu heading.



When the bottom line shows the desired menu heading -

3. Press the SELECT knob .



Top line show menu item.

Bottom line shows current setting*

*[if this setting is correct, rotate the SELECT knob to continue to the next menu item].

4. Press the SELECT knob to change the desired setting.



Rotate the SELECT knob to the desired setting.

When the bottom line shows the desired setting -

5. Press the SELECT knob to "save" this desired setting.

Figure 3-2, SETUP Menu Navigation

3.2 Pushbuttons and Menu Items

The five menu pushbuttons (FAVS, CTRL, METER, SETUP or TECH) allow the inverter/charger system to be configured to your specific preferences. These menus also allow you to access menu items that can help with monitoring and troubleshooting your system.

Read this section to help understand the function of each Menu button and the configurable settings - to determine if they should be changed to optimize the operation of the inverter/charger.

3.2.1 FAVS Button

The FAVS button is short for FAVORITES. This button is similar to the Favorites button on your TV remote, it allows you to store the most frequently used menu items for quick reference or changes to the system.

This menu button allows 5 menu items to be stored for quick access without having to find them within the SETUP or other control buttons. The 5 menu items stored under the FAVS button should be the "favorite" menus most often used.

Before changing the default FAVS menu items it is suggested that you thoroughly review all the menu items in the menu map on pages 34 thru 37 and make a short list of the items you think you will use most often. Once you have determined which 5 items you would like to make your favorites, then decide in what order you would like those menus to appear under the FAVS button. This is important since you will assign a FAVS position 1-5 for each menu item you select to be a FAVS.

Menu items can be changed anytime under the FAVS button. Navigate to the menu item that you would like to set as a favorite, then push and hold the FAVS button for 3 seconds. After 3 seconds the screen will show "Select FAV: F1" on the bottom line. Rotate the knob to select FAVS 1 through 5. Once you have decided which location you would like the menu item to be in, press the SELECT knob to save the menu item at the selected location.



Info: The FAVS button can be used to store menu items that would otherwise not be accessible after a PIN has been set for the SETUP menu.



Info: Menu "Headings" cannot be stored in FAVS, only menu "Items". Menu headings are identified with a number followed by the Menu heading. Menu items are identified by a number followed by a letter.

Example: "02 Invert Setup" is a menu heading

Status
02 Invert Setup

Example: "02A Search Watts" is a menu item

02A Search Watts
5 Watts

3.0 Setup

The FAVS button has five default menu items stored from the factory and may be changed by accessing menu items using the METER, SETUP or TECH button.

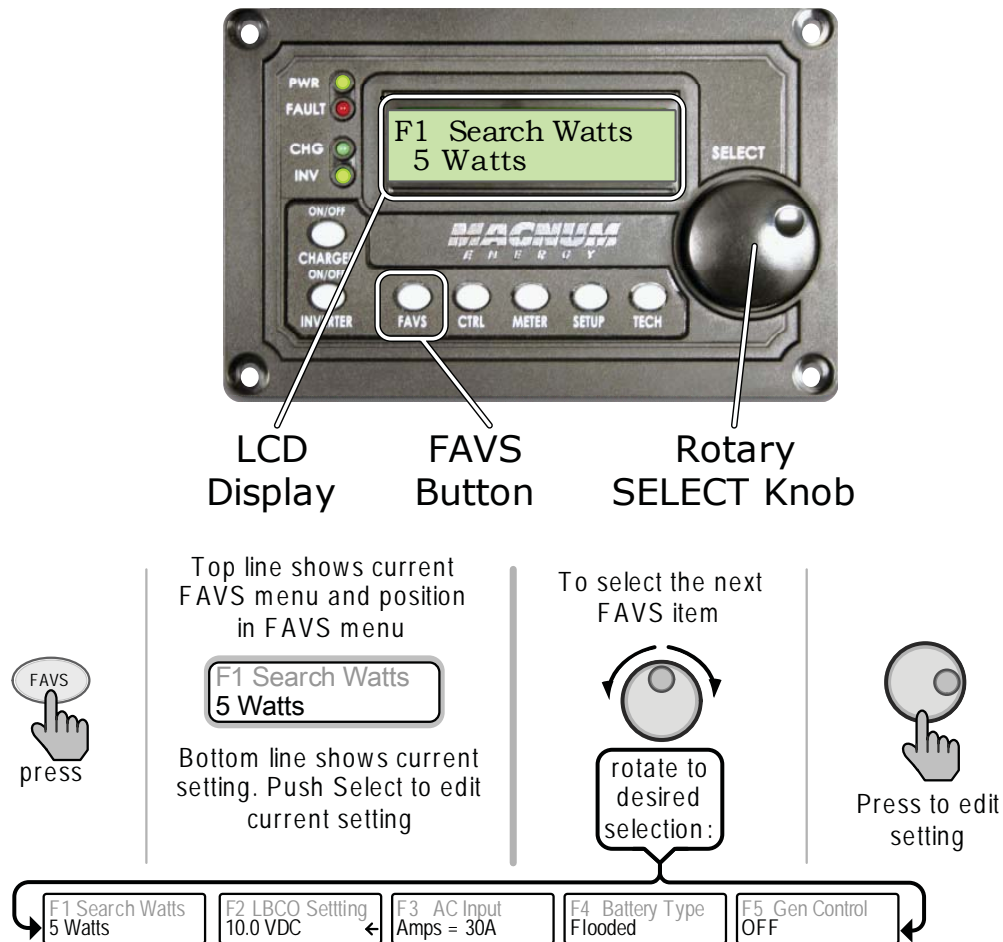


Figure 3-3, FAVS Button

Default Settings:



Info: Refer to page 6, 3.2.1 FAVS button for information on how to change a FAVS menu item.

FAVS: F1 Search Watts - Search Watts is the F1 default (FAVS #1). Refer to page 20 for SETUP 02A Search Watts on how to adjust the Search Watt setting.

FAVS: F2 LBCO Setting - LBCO (Low Battery CutOut) is the F2 default (FAVS #2). Refer to page 20 for SETUP 02B LBCO setting on how to adjust the LBCO setting.

FAVS: F3 AC Input Amps - AC Input Amps is the F3 default (FAVS #3). Refer to page 24 for SETUP 03A AC Input Amps on how to adjust the AC Input Amps

FAVS: F4 Battery Type - Battery Type is the F4 default (FAVS #4). Refer to page 24 for SETUP 03B Battery Type on how to set the Battery Type.

FAVS: F5 Gen Control - Gen Control is the F5 default (FAVS #5). Refer to page 11 for CTRL 03 Gen Control on how to operate the Gen Control function.

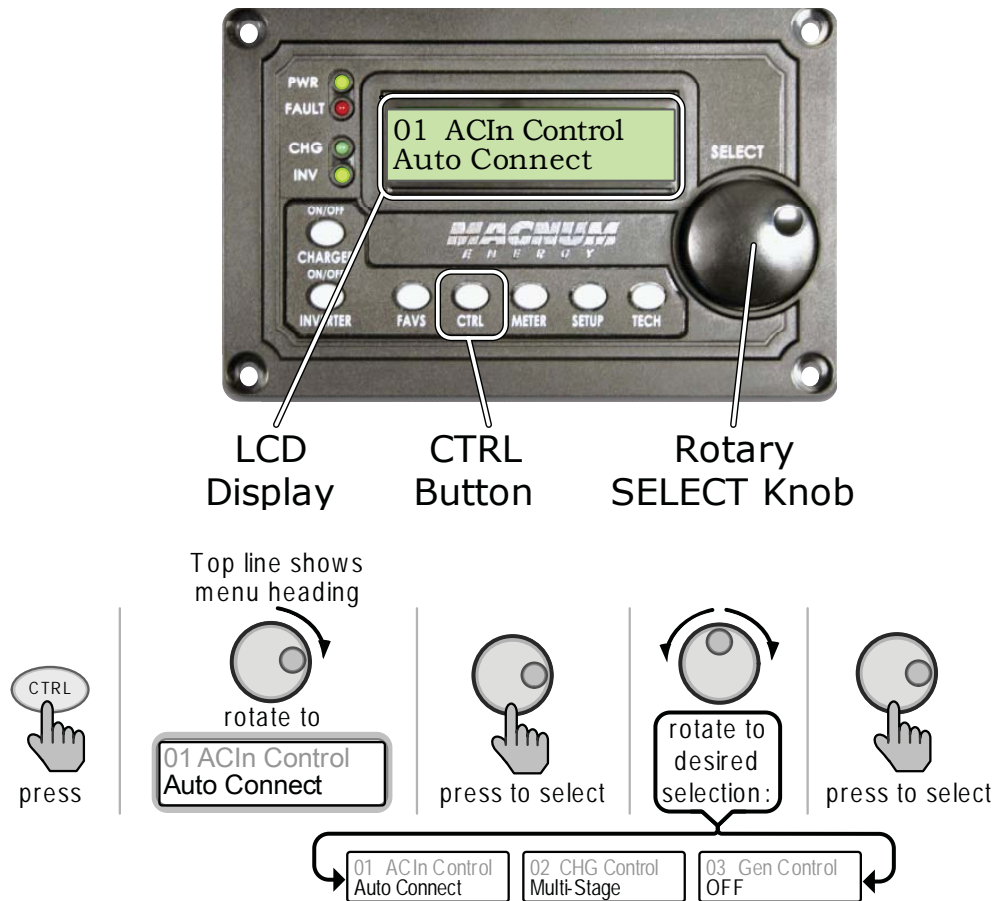


Figure 3-4, CTRL Button

3.2.2 CTRL (Control) Button

The CTRL menu button contains the menus for “ACIN CONTROL”, “CHG CONTROL” and “GEN CONTROL”. The CTRL button gives you quick control of the main functions of the inverter/charger without having to access the SETUP menus in order to change operation of the inverter/charger or generator.

The SETUP menus are used to program all of the user settings for operation of the inverter/charger and accessories. Once the settings have been programmed in the SETUP menus the features can then be enabled using the CTRL button.

Example: In the SETUP menu “02C AC In - Time” you set the time of day (e.g. 12AM to 8AM) that you want the inverter to connect to the incoming AC. Once this time is set in the setup menu use the CTRL button to access the “ACIn Control” menu and select “Time Connect”. When “Time Connect” is selected the inverter/charger will only connect to AC when the time is between 12AM and 8AM.

3.0 Setup

01 ACIn Control

AC In Control has four different conditions in which the inverter/charger will connect to incoming AC power. Only one condition may be set at any one time. Refer to the Setup section for information on how to use each of the following settings.

Multi Connect: Automatically connects to incoming AC power when the incoming AC is qualified by the inverter/charger (voltage is above VAC Dropout setting and between 50Hz to 70Hz for domestic models, and 40Hz to 60Hz for export models).

VDC Connect: Connects to incoming AC when the DC battery voltage is below the "Set Connect Volts" setting in menu "02D AC In - VDC", and disconnects from incoming AC when the DC battery voltage is above the "Set Disconnect Volts", also in menu "02D AC In - VDC".

Time Connect: Connects to incoming AC when the time of day is between the "Connect Time" and "Disconnect Time" in menu "02C AC In - Time".

AC In: Disabled - Disconnects incoming AC when selected. This setting will prevent incoming AC from connecting to the inverter/charger.



Info: The top status line of the LCD display will alternate the inverter/charger status with a *secondary* AC IN status if AC is present, but not connecting as a result of a selection made in the SETUP menu.

Example: AC is present but AC IN -Time has been selected in the 01 ACIn CTRL menu, and the current time of day 2PM. In menu 02C AC In-Time the current setting is 12AM - 8AM. The current time of 2PM is outside the connect time so the inverter/charger will not connect to the incoming AC until after 12AM. The *primary* status will display "Inverting" and the *secondary* status will display "Time Connect" to let you know the reason that incoming AC has not connected.



Info: See SETUP menus 02C and 02D on pages 21 and 22 for complete explanation of VDC Connect and Time Connect menu settings.

02 CHG (Charge) Control

CHG Control allows you to set the Charger Mode for Multi-Stage, always stay in Float, Restart Bulk which restarts the Multi-Stage charge profile. Most of the time the charger should be left in the multi-stage setting but if you want to override this setting use the CTRL button and CHG Control menu to change the charger profile.

Multi-Stage: This charge profile starts in "Bulk" (maximum current until the Absorption voltage is reached), then transitions to the Absorption cycle (Absorption cycle as determined by the settings in SETUP menu 03E Absorb Done), and finally transitions to the final charge stage as selected in SETUP menu 03G Final charge.



Info: Any time during the charge cycle the charger may be "forced" into Float or Rebulk, using Force Float or Restart Bulk from the CTRL button 02 CHG Control menu.



Info: Multi-Stage must be selected in order for the Final Charge Stage selected in menu 03G Final Charge Stage to be used.

Force Float: This charge profile “forces” the charger to stay in the Float mode as long as AC is present and the charger is active. Force Float is most often used when another source of charging such as PV, wind or hydro is available to keep the batteries at or above the Float voltage. If AC is disconnected and then reconnected the charger will go directly to the Float mode and will not do a Bulk or Absorption charge cycle.



CAUTION: Using the Force Float mode may not fully charge the batteries. Most batteries require a Bulk and Absorption charge cycle in order to fully recombine the electrolyte in the batteries and bring the specific gravity to the proper level. Be sure to check with your battery manufacture before using this setting.



Info: If Silent is selected in menu 03G Final Charge Stage you can override this selection with Force Float to temporarily Float the batteries.

Restart Bulk: This selection restarts the Bulk cycle from any stage in the charge cycle. Restarting the Bulk stage is useful when a full Multi-stage charge cycle does not bring the specific gravity of the batteries to the proper level.



Info: Restart Bulk will default back to the Multi-Stage once the inverter/charger status displays “Bulk Charging”.



Info: If you have to continually restart the Bulk cycle in order to bring the batteries to full charge, check the settings in SETUP menu “03 Charger Setup” to make sure the batteries are fully charged at the end of a regular multi-stage charge cycle. Check with your battery manufacture for proper battery charger settings.



CAUTION: Frequently restarting Bulk may result in overcharging of the batteries.

03 GEN Control

GEN Control is used for controlling a standby generator connected to the system using the optional ME-AGS-N. Once the ME-AGS-N is installed in the system, the generator can be manually started and stopped or set to the auto start and stop mode from the GEN Control menu.



Info: The ME-AGS-N, Multi Gen Start Network, version must be installed in order for the 03 GEN Control menu to control a standby generator. Refer to the ME-AGS-N manual for more information on controlling standby generators.

OFF: The OFF selection turns the generator OFF if it is running from either a manual start or auto start command. When the OFF position is selected the generator will not start automatically.



Info: If DC power is lost to the remote, this menu resets to the default OFF position for safety.

3.0 Setup

ON: The ON selection will start the generator by sending a "start" command from the ME-AGS-N control module. Once the generator is started it may be stopped by selecting OFF from the GEN Control menu, this sends a stop command from the ME-AGS-N control module.



Info: You can manually start the generator by selecting ON from the GEN Control menu, and then change the selection to AUTO to automatically stop the generator. When the AUTO setting is selected after the generator has been manually started it will use the STOP setting in menu 04A "Set Stop Gen Volts" or menu 04F "Max Gen Run Time", whichever occurs first. This setting is useful if you want to make sure the generator starts before you leave, but also want to make sure the generator doesn't run too long, thereby wasting fuel.



The start selection uses warm-up time. The stop selection stops immediately it does not use the cool-down time.

AUTO: This selection uses the settings in "04 AGS Setup" to automatically start and stop the generator. Refer to menu 04 AGS Setup on page 29 to set the start and stop parameters for the generator.

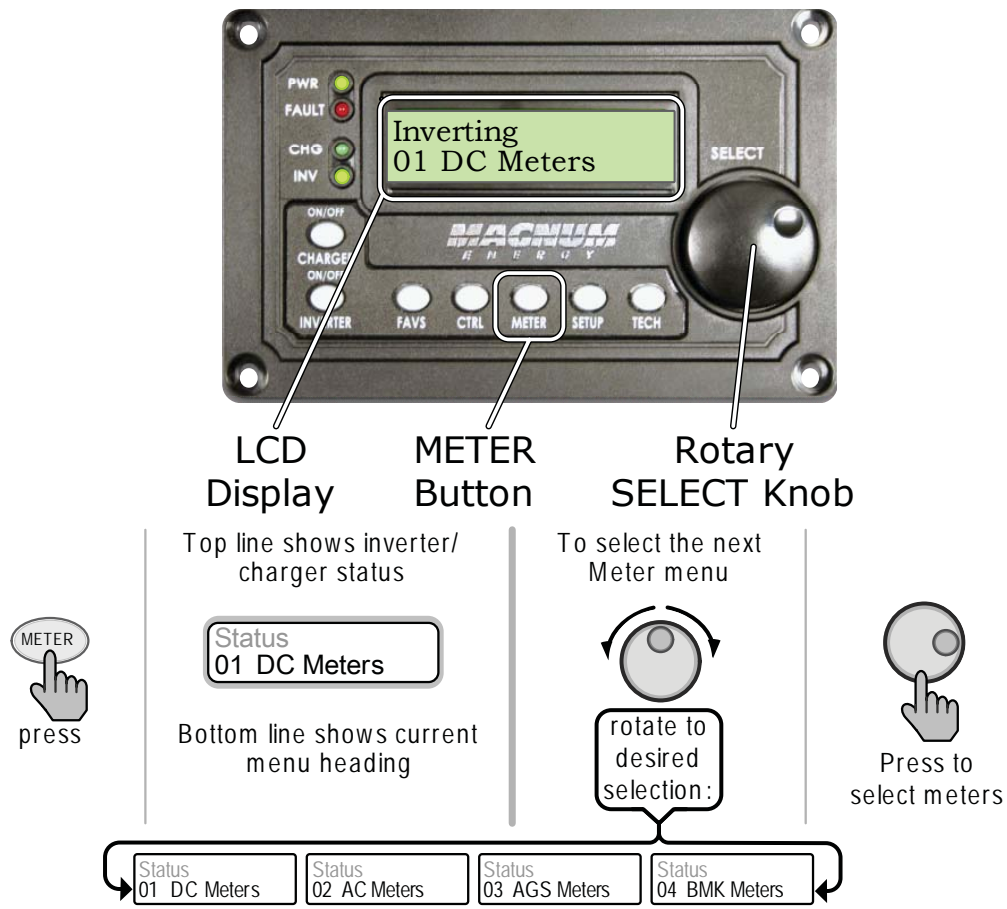


Figure 3-5, Meter Button

3.2.3 METER Button

Pressing the METER button gives you access to different meters, which helps determine the status of the inverter/charger and battery system.



Info: Some meter functions may not be accessible with older inverter software. If some meters do not function check for current inverter software.



Info: All displays will automatically returns the "Home" screen 5 minutes after the *last button push*; unless you are on a display in the METER menu where the screen will stay without returning to the "Home" screen. This feature is useful for displaying commonly used meter readings like SOC, where it is useful to see the battery status "at a glance".

01 DC Meters - DC Meters display battery voltage, DC amps from the inverter/charger and the time in charge mode. Use these meters to monitor your battery bank.

- **01A DC Volts:** This menu provides the DC battery voltage. The DC: V (Volts) display provides the voltage from the batteries connected to the inverter. The DC: V accuracy is $\pm 1.5\%$ with a 0.1 VDC resolution.
- **01B DC Amps:** While inverting, the DC: A (Amps) displays a negative number to show the battery current used by the inverter. If in charge mode, the DCA (amps) displays a positive number to show the amount of current delivered to the batteries. The accuracy of this display below 1 amp AC (~ 10 amps DC @ 12VDC) is not detected. When the current in or out of the batteries is greater than 1 amp AC, the display accuracy is $\pm 20\%$.
- **01C Charge Time:** This meter reads whenever the charger is in the Bulk or Absorb mode. The meter does not accumulate time when in Float, Charger Standby, Full or Silent mode.



Info: Once the charger leaves the absorption mode and enters the "Final Charge Stage", this timer is reset and will not accumulate until the charger reenters the Bulk or Absorption charge mode.

3.0 Setup

02 AC Meters

- **02A Output Volts:** This provides the AC voltage measurement at the inverter's output terminals. If inverting, this would measure the inverter's output voltage. If in charging mode, this would measure the AC voltage that is passing through the inverter from the source (e.g. grid or generator).
- **02B Output Hertz:** While inverting, this menu displays the output frequency of the inverter in Hertz. This menu provides the AC Output Hertz on the output of the inverter at the inverter AC output terminals. When the AC input is connected to an incoming AC source, this display shows the frequency (Hertz) of the incoming AC source (i.e. grid or generator) that is passing through the inverter to the inverter output terminals.
- **02C Load Amps:** This menu displays the load the inverter is running in the Inverting mode in AC amps measured at the inverter output terminals. This number is always displayed as a positive number.
- **02D Input Amps:** This menu displays the total AC amps being used by the inverter for charging and any connected load at the output of the inverter.

Example: If the charger is using 20A from the AC source and the load connect to the inverter output is using 10A, the combined load on the incoming AC source is 30A. So, 30A would be displayed as the Input Amps.



Info: The 02D Input Amps is determined by adding the 02C Load Amps and the 02E Inv/Chg Amps.

- **02E Inv/Chg Amps:** This menu displays the amps the charger is using from the AC source.



Info: The 02E Inv/Chg Amps is determined by subtracting the 02C Load Amps from the 02D AC Input Amps.

03 AGS Meters

03A AGS Status: There are 26 different status messages that can display to determine what state the ME-AGS-N is currently in, but only one will be displayed at any one time.



Info: This menu is most important to determine if the ME-AGS-N is working correctly, or for troubleshooting an installation of an ME-AGS-N.



Info: For any "Fault" mode listed in the status menu, please refer to the ME-AGS-N Owner's Manual (part number: 64-0005) for troubleshooting information.

- **AC In:** The charger is connected to another source, such as grid or another generator and not controlled by the ME-AGS-N.



Info: When AC In is displayed, the AGS is locked out from auto starting.

- **Gen Cooldown:** The stop setting has been satisfied in one of the generator start/stop menus and the generator has been disconnected from the inverter/charger, but is still running until the cooldown time is satisfied in menu "04J Gen Cooldown Time".
- **Gen Warm-up:** The generator has successfully started on one of the start settings, but has not connected to the inverter/charger because it is waiting to satisfy the warm-up time set in menu "04I Gen Warm-up Time".

- **Manual Run:** The generator has be started manually either from the "03 Gen Control" menu or from a start/stop switch directly connected to the generator.
- **No Comm:** The ME-AGS-N is not communicating with the ME-ARC remote. Causes could be a bad ME-AGS-N network cable, no power to the ME-AGS-N, or there is no ME-AGS-N installed in the system.
- **Off:** Generator is off and the AGS will not auto start the generator.
- **Quiet Time:** The ME-AGS-N has entered Quiet Time as set in menu "04G Quiet Time". The generator will not auto start during Quiet Time.
- **Ready:** 03 Gen Control is set to Multi, and the ME-AGS-N is ready to automatically start the generator based on the 04 AGS Setup settings.
- **Start Amp:** The generator has started based on the settings in menu "04C Gen Run Amps".
- **Start Exercise:** The generator has started based on the settings in menu "04H Gen Exercise".
- **Start SOC:** The generator has started based on the settings in menu "04D Gen Run SOC".
- **Start Temp:** The generator has started based on the settings in menu "04E Gen Run Temp".
- **Start Test:** The ME-AGS-N is in the test mode. The test mode may be started from the test button located on the ME-AGS-N (see the manual for the ME-AGS-N for further information on the test button).
- **Start Time:** The generator has started based on the settings in menu "04B Gen Run Time".
- **Start Topoff:** The generator has started based on the settings in menu "04G Quiet Time".
- **Start VDC:** The generator has started based on the settings in menu "04A Gen Run VDC".
- **Fault Amp:** The generator failed to start in the "Start Amps" mode.
- **Fault Exercise:** The generator failed to start in the "Start Exercise" mode.
- **Fault MaxRn:** The generator exceeded Max Run Time and has turned off.
- **Info:** The generator will shut down when reaching the Max Run Time and may still be running if this fault is observed.
- **Gen Run Fault:** The generator successfully started and ran fro more than 5 minutes, but unexpectedly stopped before the ME-AGS-N could automatically stop the generator.
- **Fault SOC:** The generator failed to start in the "Start SOC" mode.
- **Fault Temp:** The generator failed to start in the "Start Temp" mode.
- **Fault Test:** The generator failed to start in the "test" mode.
- **Fault Time:** The generator failed to start in the "Start Time" mode.
- **Fault Topoff:** The generator failed to start in the "Start Topoff" mode.
- **Fault VDC:** The generator failed to start in the "Start VDC" mode.

3.0 Setup

- **03B DC Volts-AGS:** This menu displays the DC voltage measured at pins 3 and 4 of the ME-AGS-N module. This menu is useful in setting up the voltage start for the AGS and for troubleshooting the operation of the AGS.



Info: The DC voltage reading in this menu may vary from the DC voltage reading in menu "01A DC Volts" and "04C DC Volts-BMK". Each DC voltage reading is taken at a different place in the system and therefore there may be wire losses or connections that make the readings differ. It is important when troubleshooting the system to read the appropriate related meter for each device i.e. when troubleshooting the AGS use "03B DC Volts-AGS" for verification and testing purposes.

- **03C Gen Run Time:** This menu displays the time the generator has been running since the AGS auto started the generator. This menu does not display run time when the generator has been manually started.



Info: This hour meter resets each time the generator is stopped. This meter is useful when trying to determine how long the generator has been running in the auto mode if you were not present when it started. This meter does not replace the hour meter for total hours the generator has run.

- **03D AGS Temp:** The menu displays the temperature of the AGS Temp sensor (included with ME-AGS-N, but use is optional) and is helpful in determining proper placement and operation of the AGS temp sensor.
- **03E Days Since GenRun:** This menu displays the number of days since the generator has last run. This menu is useful in determining if the AGS start and stop settings are set up correctly.



Info: This meter resets whenever the generator is either auto started, exercised or manually started. The meter reads the B+ signal provided by the generator to the AGS module for this meter.

04 BMK Meters

- **04 BMK Meters:** These meters display the reading from the optional ME-BMK, if installed.
- **04A BMK Status:** There are 3 status menus to determine what state the BMK is in.

BMK Ready: This indicates there is an optional ME-BMK installed in the system, and that it is powered and communicating with the ME-ARC.

Power-up Fault: This indicates the ME-BMK has failed to properly power-up during normal installation procedures. Refer to the ME-BMK manual for troubleshooting information.

No Comm: This indicates the ME-BMK is not communicating with the ME-ARC. The most common causes are; No ME-BMK installed in the system, bad network cable, no power to the ME-BMK. Refer to the ME-BMK for troubleshooting information.



Info: These menus allow the optional ME-BMK (Magnum Energy's Battery Monitor Kit) - if installed - to display the status of the battery system; refer to the ME-BMK Owner's Manual (part number 64-0013) for detailed information on the Battery Monitor Kit and these menus.

- **04B SOC:** This display is the best way to monitor the actual state of the battery. The read only display shows the State Of charge (SOC) for the connected battery bank. The SOC represents the condition of the battery as a percentage of the available capacity left in the battery. Range is 0% to 100%, where 100% represents a fully charged battery and 0% means the battery is completely discharged.
- **04C DC Volts - BMK:** This meter displays the real-time battery voltage from 07.00 to 70.00 volts (± 0.02 volts).
- **04D DC Amps - BMK:** This meter displays the real-time charge current (amps into the battery) or discharge current (amps out of the battery). Charging is shown as a positive (+) number and discharging is shown as a negative (-) number. The range is from ± 0.1 to 999 amps, with a 1.0% accuracy.
- **04E AH In/Out:** This meter displays the Ampere-Hours returned to or removed from the battery. When this value is positive, it represents amp-hours returned to the battery during any subsequent charging. A negative value represents amp-hours removed from a full battery. Its range is ± 32768 AH.
- **04F Resettable AH:** This meter displays the total amp-hours removed from the battery since it was last reset. This display can be used as a battery load indicator; to help determine and monitor the battery load consumption. Its range is 0 to 65,535.0 amp-hours (0.1 amp hour resolution).
- **04G Total AH Out:** Total Amp-Hours Removed; this meter displays the total amp hours removed from the battery since the Sense Module was first connected. This display can be used as a battery service life indicator. The value is displayed in 0.1k [or 100 amp-hours ("k" equals 1000)] resolution up to a maximum of 6,553.5k amp-hours (6,553,500 amp-hours). The displayed number resets to 0.0k when the Sense Module is disconnected from power.
- **04H Minimum VDC:** This menu displays the lowest battery voltage since the last reset. The voltage shown on the display is averaged each second and is helpful when troubleshooting or detecting an over-discharge condition.
- **04I Maximum VDC:** This menu displays the highest battery voltage since the last reset. The voltage shown on the display is averaged each second, this allows you to check your charging system (battery charger, charge controller, etc.), to ensure the charging voltage has been attained. This display is also helpful when troubleshooting or detecting if an over-charge condition has occurred.

3.0 Setup

3.2.4 SETUP Button

The first screen that may appear when the SETUP button is pushed is a password screen. If the PIN has been set under the TECH button menu *05 SETUP PIN*, the first screen will be the "Enter Setup PIN =" screen. The proper PIN will now have to be entered in order to access the SETUP menus. After 5 minutes from the *last button push*, the display will automatically bounce to the "Home" screen and the PIN will need to be reentered in order to access the SETUP menus.



Info: Refer to menu "05 SETUP PIN" under the TECH button to set or change the PIN number.



Info: In any SETUP menu that contains a range of settings, if the first and last settings are equal (set to the same value), the function will be disabled, even if selected/enabled from the CTRL menu.

Pressing the SETUP menu button provides access to the menu items and settings that allow the ME-ARC display, inverter/charger, ME-AGS-N and ME-BMK to be configured. Read each menu item to determine if any setting requires adjustment to meet your system requirements.

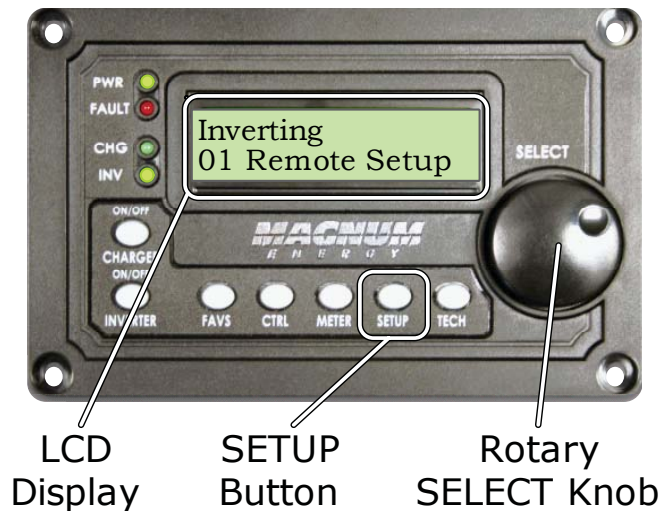
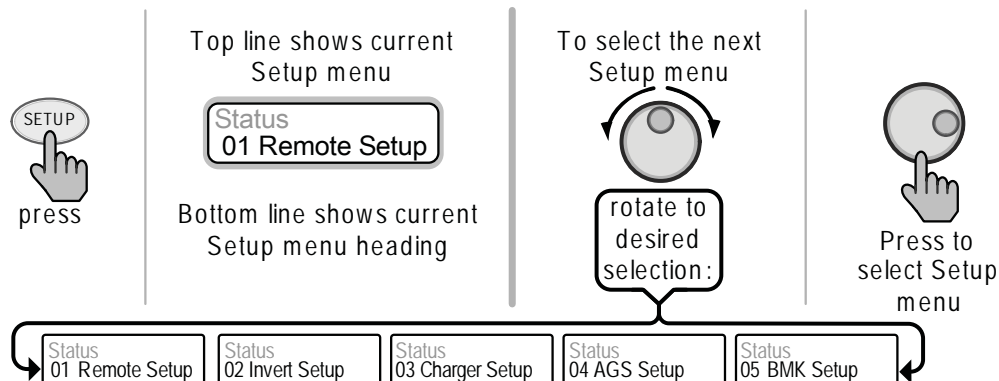


Figure 3-6, Setup Button



01 Remote Setup

01 Remote Setup - The following menus 01A-01D are used to set up the remote screen and clock.

- **01A Set Clock:** The ME-ARC contains a real time clock that must be set for proper operation of some features. These features are: 02C AC In-Time, 04B Gen Run Time, 04G Quiet Time, 04H Gen Exercise and 04 Fault History under the TECH button.



Info: The clock obtains power from the inverter and will reset if the ME-ARC is disconnected from the inverter.

Set Clock Hour - Set the hour of the day between 1-12, AM-PM will be set later.

Set Clock Minute - Set the minute between 0-59.

Set Clock AM-PM - Set AM or PM.

- **01B Contrast** - Used to adjust the contrast of the LCD screen for the best looking display, based on the current lighting conditions and viewing angle. Set the Contrast from 0-100%.

Default settings: Contrast = 100%

- **01C Backlight** - Used to adjust the brightness of the LCD screen backlight for the best looking display, based on the current lighting conditions and viewing angle. Set the Backlight from 0-100%.

Default settings: Brightness = 50%

- **01D Power Save** - This setting allows you to turn off the Power Save™ feature or select the time (from Off to 60 minutes) that determines how often the display goes into Power Save mode.

Default setting: PwrSave = 15min.

What is the Power Save feature? The Power Save feature causes the LCD backlight and LED's on the remote display to turn off to conserve energy. The remote goes into Power Save mode if there hasn't been a button press or fault message for a period of time (this time is determined by the *SETUP: 01D Power Save* setting). Whenever the remote goes into the Power Save mode, the LCD backlight and LED's can be reactivated by pressing any menu button. If you have a fault during the Power Save mode, the LCD backlight and Fault LED will come on and stay on as long as the fault is present.



Info: If you want the LCD backlight and LED's to always be on, you will need to turn the Power Save feature off by selecting *Power Save = Off*.

- **01E Temp Display** - The temperature display is used to select whether to display temperatures in Fahrenheit or Celsius. When selecting either Fahrenheit or Celsius, the following menus will appear with this selection; 03D AGS Temp, 04E Gen Run Temp, and 01 Temperatures under the TECH button.

Default Setting: Fahrenheit

3.0 Setup

02 Invert Setup

The following menus 02A - 02D are used to set up only the functions related to the Inverting mode of the inverter/charger.

- **02A Search Watts** - Allows you to turn off the Search Watts feature, or adjust the power level to determine when the inverter leaves search mode. The power level range selection is Off, 5W to 50W. If this feature is not needed, select *Search=Off*. When search is turned off, the inverter continuously provides full AC voltage to the loads.

Default setting: *Search= 5 W*.



Info: When the Search Watts feature is active, "Searching" appears on the top line of the LCD display and the green 'INV' LED will slowly flash.

What is the Search Watts feature? This feature is used to help save battery power by reducing the inverter's output to search pulses when there is no detectable load. If a load greater than the wattage level setting turns on while the inverter is "Searching", the inverter will start "Inverting" to provide full voltage on its output.

Should I use the Search Watts feature? If the inverter can spend a great deal of time searching (to reduce the power drain on your batteries) and you can tolerate small loads (less than 5 watts) being OFF, then the search mode feature should be used. However, if you require some small loads (i.e. digital clocks, satellite receivers, answering machines, etc.) are required to be on, then this feature should be turned off (*Search = Off*).

Where should I set "Search Watts"? The Search Watts setting should be adjusted to the same power level (or the next lower setting) of the smallest load that you want to run. If you don't know the wattage of the smallest load you want to run, turn the load on and decrease the *Search Watts* setting until the load comes on and stays on.

Example: You have reviewed all the loads you want to run and determined that the smallest load is a 30 watt light, then set the *Search = 30W*. Whenever you turn on any load (because all the loads are greater than 30 watts), the inverter will stop "searching" and start "Inverting" to deliver power to the load.

Note: Even though the search feature is on, some connected equipment may draw enough current even while in the "off" position to keep the inverter in the "Inverting mode".

- **02B LBCO Setting** - The Low Battery Cut-Out (LBCO) setting is used to set the DC voltage level that turns off the inverter, to help protect the batteries from over-discharge damage. Selections are from 9.0 VDC to 12.2 VDC (12-volt inverter models), 18.0 VDC to 24.4 VDC (24-volt inverter models), or 36.0 to 48.8 (48-volt inverter models). If the battery voltage drops below the LBCO set-point continuously for more than 1 minute, the fault LED will come on, the inverter will turn off, and the display will show a 'Low Battery' status. If the battery voltage falls below 8.5 volts (12-volt models), 17.0 volts (24-volt models), or 34.0 (48-volt models); the fault LED and 'Low Battery' status will be immediate.

Default settings: LBCO = 10.0 VDC (12-volt models), 20.0 VDC (24-volt models) or 40.0 VDC (48-volt models).



Info: The Inverter will automatically begin inverting when the DC voltage increases to ≥ 12.5 VDC (12-volt models), ≥ 25.0 VDC (24-volt models), or ≥ 50.0 VDC (48-volt models). If AC power is available and connected to the inverter's input, the inverter will automatically clear the 'Low Battery' fault, pass the input AC power to the output, and begin charging the batteries.

Where should I set the LBCO setting? If you want to cycle the batteries slightly - but don't want to discharge them more than 20%*, then the LBCO setting should be set from 11.5 to 12.2 VDC (12-volt models), 23.0 to 24.4 VDC (24-volt models), or 46.0 to 48.8 (48-volt models). In some applications, such as those installed in an off-grid home or when doing a lot of dry-camping in your RV, you may want to cycle down to 50%* by setting the LBCO from 10.0 to 11.4 VDC (12-volt models), 20.0 to 22.8 VDC (24-volt models) or 40.0 to 45.6 VDC (48-volt models). In extreme circumstances, you have the ability to discharge the batteries to 80%* by setting the LBCO to 9.0 or 9.5 VDC (12-volt models), 18.0 or 19.0 VDC (24-volt models), or 36.0 or 38.0 VDC (48-volt models) before recharging.

* These discharge percentages are rough estimates; for accurate battery monitoring, a battery monitor such as Magnum's ME-BMK is required.



Info: The higher the LBCO setting, the less the inverter will discharge the batteries; which should allow the batteries to have a longer life. The down side to a higher LBCO setting is that you need to charge more often to prevent the inverter from shutting off in fault mode.



Info: If there is an ME-AGS-N installed, it should be set to start ≥ 1.0 volts higher than the LBCO setting - this is to prevent the inverter from shutting down before the generator comes on.

- **02C AC In-Time** - This feature allows you to connect to the local power utility at a predetermined time of day. When the current time falls within the set times, the inverter/charger connects to the AC connected to the AC input terminals. Once time passes outside the set times, the inverter/charger disconnects from the AC source. If your local power utility offers "time of day billing" this feature may save you money by only connecting to the utility when rates are the least expensive.

Default Setting: 6:00A - 6:00P

What is the "AC In-Time feature"? This feature allows the incoming AC to connect to the inverter/charger and charge the batteries only during the time of day set in the 02C AC In-Time menu. Even if AC is present on the AC input terminals of the inverter/charger it will only connect during those times that were previously set up.

3.0 Setup

Should I use the “AC In-Time” feature? The most common use of AC In-Time is when your local utility company offers peak rate savings. Peak rate savings are when the utility company offers a lower rate per kWh (kilo Watt hour) on your power bill, usually at night when there is less demand on the local utility grid.

Where should I set “AC In-Time”? Check with your local utility company or installer and see if they offer lower rates at particular times of the day. If a lower rate is offered try setting your connect time to coincide with the utility companies lower rates, this will save you money.

Example: Your standard rate on your power bill is \$.10 kWh. Your utility company offers \$.08 KWH between 12:00 AM and 7:00AM. Set your connect time to coincide with the utility company’s lower rates in order to save money when using utility power to charge the batteries.

- **02D AC In-VDC** - AC In-VDC used to determine when the inverter/charger connects to incoming AC based on VDC (Battery Voltage). AC In-VDC is set in a range of battery voltages, the first being the connect DC voltage at which the inverter/charger will connect to incoming AC and the second the disconnect DC voltage at which time the inverter will disconnect from incoming AC. This setting is typically used when an alternate charging source(s) is present. The alternate charging sources may be PV, wind and or hydro. Typically AC In-VDC is used optimize the alternate charging source(s), and only use the grid to charge the batteries if the alternate charging source is not able to maintain the batteries above the “Set Connect Volts” setting.

Default Setting: 11.0 - 14.1 VDC

What is the “AC In-VDC” feature? This feature allows the incoming AC to connect to the inverter/charger and charge the batteries only during the set voltage in 02D AC In-VDC menu. Even if AC is present on the AC input terminals of the inverter/charger, it will only connect to incoming AC when the “Set Connect Volts” setting is reached. It will disconnect when the “Set Disconnect Volts” voltage is reached.

Should I use the “AC In-VDC” feature? The most common use of AC In-VDC is when you have an alternate source(s) of battery charging. The most common sources of alternate battery charging are PV, wind and or hydro that are directly connected to the batteries via a charge controller. In order to optimize the alternate charge source(s), the incoming AC must be prevented from connecting to the inverter charger or the inverter/charger will take over charging the batteries and the alternate source will not be used.

Where should I set “AC In-VDC”? Check with your battery manufacturer or installer in order to determine the correct settings for your batteries. Typically battery manufacturers don’t recommend discharging the batteries below 50%, which when related to a voltage setting is approximately 12.0-12.2 VDC, 24.0-24.4 VDC and 48-48.8 VDC for 12, 24 and 48 volt batteries respectively.

Example: In order to protect the batteries from over discharging you set the connect voltage at 12.2 VDC, 24.4 VDC or 48.8 VDC respectively. If the alternate charge source can not keep the battery charged, then the grid will connect at 12.2 VDC and charge the batteries. You would set the disconnect voltage at the Absorb voltage for your batteries to make sure the batteries received at least a 75-80% charge before the AC is disconnected.

03 Charger Setup

- **03A AC Input Amps** - This selection ensures that the combined current draw from the charger and the AC loads does not exceed the maximum input current that is available. Whenever the utility or generator is connected to the inverter (thru AC HOT 1), the current used to power the AC loads and to charge the batteries is monitored. When the total current used to power the AC loads and charge the batteries begins to approach the AC Input Amps setting, the current that was used for charging the batteries will automatically be reduced. This ensures the AC loads have all the available current when needed.

Default setting: Amps = 30 Amps

Where should I set AC Input Amps? Set the AC Input Amps setting to match the current rating of the utility power or generator's circuit breaker. If using multiple AC sources (utility and generator) through an AC transfer switch, adjust this setting to the smaller AC breaker size. This setting is very dependent on the stability of the AC source. If using a generator, factors such as altitude and output voltage regulation may require a lower setting than the generator's breaker size. For best performance, lower this setting to 1/3 its rated capacity and gradually increase while ensuring the voltage level stays above the 03D VAC Dropout setting.



CAUTION: The AC Input Amps setting does not limit the current to the inverter loads. If the current from the loads on the output of the inverter are greater than the circuit breaker rating on the incoming AC source, you may experience nuisance tripping on this breaker.



Info: This setting will control the input current differently depending on the inverter/charger model and AC input wiring configuration selected for your particular model. ME, MS and RD models have 2 AC inputs, HOT IN 1 and HOT IN 2. AC Input Amps is only monitored on HOT IN 1 on these models when wired as dual-in/dual-out configuration. On these models, if single-in/single-out configuration is selected and HOT IN 1 and HOT IN 2 are jumped together, then you should set the AC Input Amps to 1/2 the input breaker size, as 1/2 the current will pass through HOT IN 1 and HOT IN 2 simultaneously.

If MS-AE or MS-PAE models are used, these models have HOT IN 1 and HOT IN 2 and the current on *both* inputs are monitored. Set the AC Input Amps to match the input breaker size on these models.

3.0 Setup

- **03B Battery Type** - Used to select the battery type, which determines the battery charge profile and ensures the batteries are receiving the proper charge voltage. The fixed voltage selections are GEL (for Gel batteries), Flooded (for liquid lead acid batteries), AGM 1 (for Lifeline AGM batteries), and AGM 2 (for East Penn/Deka/Discover/Trojan AGM batteries). The 'Custom' selection allows the Float and Absorb charge voltage settings to be individually adjusted. See Table 3-3 to determine the specific charge voltage based on the Battery Type selected.

Default setting: Battery Type = Flooded



Info: The voltage settings shown in Table 3-3 are based on the Battery Temperature Sensor (BTS) having been disconnected or at a temperature of 77° F (25° C). If the BTS is connected, the actual charge voltage will increase if the temperature around the BTS is below 77° F (25° C), and decrease if higher than 77° F (25° C). This ensures the batteries receive the correct charge voltage regardless of temperature.

Table 3-3, Battery Type to Charge Voltages

Battery Type	Inverter Voltage	Absorption Voltage	Float Voltage	Equalization Voltage
GEL	12 VDC	14.1 VDC	13.6 VDC	14.1 VDC ¹
	24 VDC	28.2 VDC	27.2 VDC	28.2 VDC ¹
	48 VDC	56.4 VDC	54.4 VDC	56.4 VDC ¹
Flooded	12 VDC	14.6 VDC	13.4 VDC	15.5 VDC
	24 VDC	29.2 VDC	26.8 VDC	31.0 VDC
	48 VDC	58.4 VDC	53.6 VDC	62.0 VDC
AGM 1 ²	12 VDC	14.3 VDC	13.1 VDC	15.5 VDC
	24 VDC	28.6 VDC	26.2 VDC	31.0 VDC
	48 VDC	57.2 VDC	52.4 VDC	62.0 VDC
AGM 2 ³	12 VDC	14.5 VDC	13.5 VDC	14.5 VDC ¹
	24 VDC	29.0 VDC	27.0 VDC	29.0 VDC ¹
	48 VDC	58.0 VDC	54.0 VDC	58.0 VDC ¹
Custom ⁴	12 VDC	12.0-16.0 VDC	12.0-16.0 VDC	15.0-16.0 VDC
	24 VDC	24.0-32.0 VDC	24.0-32.0 VDC	30.0-32.0 VDC
	48 VDC	48.0-64.0 VDC	48.0-64.0 VDC	60.0-64.0 VDC

Note 1: voltage same as absorption voltage - to prevent equalization.

Note 2: specifications for Concord (Lifeline Series) AGM batteries.

Note 3: specifications for East Penn, Deka, Discover and Trojan AGM batteries.

Note 4: requires inverter with enabled software to operate.

- **03C Max Charge Rate** - Used to set the maximum charge rate allowed to charge the batteries during bulk, absorption, float and equalize charging. Selections are 'Max charge = 0%' up to "Max charge = 100%". The Max charge = 0% setting is available to help minimize charging while continuing to allow pass-thru power. The rest of the selections are provided to limit the charge rate to the battery bank, which helps prevent battery overheating caused by charging at too high a charge rate.

The Max Charge selections are provided as a percentage of the inverter/charger's maximum charging capability. Refer to the label on the side of the inverter or the operator's manual for the inverter/charger, to determine its maximum charge rate. Once you find this maximum charge rate, determine the percentage needed to limit the charge rate to your battery bank.

For example, if the maximum charge rate of your inverter/charger is 100 amps and you need to limit the charge rate to 50 amps, choose the Max charge = 50% selection (50 amps = 50% of 100 amps).

Default setting: Max Charge Rate = 100%



Info: If the Max Charge Rate is set to 0%, the topology of the Magnum inverter, when connected to an AC source, will override the 0% setting and start charging if the battery voltage is <12 VDC (12 VDC models), <14 VDC (24-volt models), or <28 VDC (48-volt models).

How do I determine where to set my maximum charge rate? The maximum charge rate is generally set to a C/5* rate (C = the total amp-hour capacity of the battery bank - using the 20-hour AH rate). The C/5 rate is usually used when the objective is to charge the batteries as quickly as possible (i.e. 400 AH ÷ 5 = 80 amp maximum charge rate). A lower rate such as C/20* is used when the batteries need to be charged as slow as possible.



CAUTION: The C/5 or C/20 charge rate settings are guidelines; they are not requirements on how you should set your battery charge rate. For specific charge rate requirements, refer to your battery manufacturer.



Info: If multiple inverter/charger's are used on a single battery bank, you must ensure that the total charge rate from all inverter/chargers is limited to the maximum charge rate needed for your battery bank. The Max Charge Rate only limits the charging on each inverter/charger individually, not on all inverter/chargers.

* C/5 or C/20 rate - charge rates are commonly expressed as a ratio of the total amp-hour (AH) capacity of the battery bank. For example, with a 400 AH battery bank (C = 400), the C/5 charge rate is 80 A (400/5 = 80 A).

- **03D VAC Dropout** - Used to select the minimum AC voltage that must be present on the input before the inverter/charger switches from Inverter Mode to Charger Mode. For example: If this setting is set to *Dropout = 60 VAC*, then the AC input voltage must be above 60 Volts before the inverter will switch from inverter mode to charge mode.

This setting also determines the minimum AC voltage threshold where the charger disengages and the inverter (when turned on) will provide AC power from the batteries. This protects AC loads from utility outages. For example: If this setting is set to *Dropout = 60 VAC*, when the AC input voltage drops to 60 volts, the inverter will switch from charge mode to inverter mode.

Default setting: Dropout 80 VAC (Export inverter models 160 VAC)

3.0 Setup

Where do I set my VAC Dropout? It depends on the application and what you are using as the AC source. The settings not only look at the incoming voltage level to determine when to transfer, but also determines how quickly the charger disconnects and starts Inverting based of the fluctuations of the incoming AC voltage.

- **Dropout = 60 VAC to 100 VAC (For Export inverter Models: Dropout = 120 VAC to 200 VAC):** Use a VAC Dropout setting from 60 VAC to 100 VAC (Export models: Dropout from 120 VAC to 200 VAC) when the AC source may have fluctuations in RMS voltage. These settings attempt to prevent the charger from disengaging unnecessarily due to poor quality voltage; and are highly recommended if using a generator for charging. The transfer time from charge mode to inverter mode is >16 milliseconds when using these settings.
- **Dropout = UPS mode:** Use the 'UPS mode' setting when the AC source is well regulated above 105 VAC (210 VAC for Export inverter models) and the inverter loads are sensitive to voltage fluctuations. This setting is intolerant of voltage fluctuations and will provide a quick transfer. The transfer time from charge mode to inverter mode is ≤ 16 milliseconds when using this setting. For generator charging, do not use this setting.



Info: If you get nuisance AC disconnects, either change the setting to 100 VAC or less (Export inverter models: 200 VAC or less), or obtain a better voltage regulated AC source.

03E Absorb Done Time, Amps or SOC

- **03E Absorb Done Time** - This setting is used to determine when the second stage of battery charging or Absorption Stage is finished and transitions to the Final charge stage (see 03G Final Charge Stage). Absorption is the second stage of the charge process and the batteries will be approximately 75-80% charged. The remaining 20-25% of the charge is finished in the Absorb mode.

Default Setting: Absorb Done Time = 2.0 Hrs



Info: If the Absorb stage is short or terminated the batteries may not receive a full charge. In contrast if the Absorb stage is too long the batteries may be overcharged either scenario may lead to damage to the batteries. Contact your battery manufacturer to ensure the best charge settings are used for your type of batteries.

- **Set Absorb Done Time** - Set Absorb Done Time is used when a specific time is determined to be the best solution for ending Absorption time. When using time the battery bank size will typically determine how long the Absorb time setting is. The larger the battery bank the longer the Absorb time to ensure a full charge to the batteries is accomplished. Taking specific gravity readings of the batteries and adjusting the Absorb time may be needed in order to obtain the appropriate Absorb time for your battery type and battery bank size.

Default Setting: Absorb Done Time = 2.0 Hrs

- **Set Absorb Done Amps** - This setting is used when the return amps of the battery bank is used to determine when the batteries are fully charged. Absorb Done Amps is the DC amps the batteries are accepting from the charger during the Absorb charge cycle. Most battery manufacturers use a specific formula to determine the return amps that indicate a fully charged battery for their particular type of battery. The formula used by most manufacturers to Absorb the batteries is $C/20$, where C =Battery Bank total Amp Hours. Basically, they take approximately 5% of the total battery bank size and consider the battery totally charged when the charge rate drops to this level. Continuing to charge will possibly overcharge the batteries. Check with your battery manufacturer in order to determine the correct return amp settings for your batteries.

Default Setting: Absorb Amps = 20 ADC



Info: If DC loads are connected directly to the batteries it is not recommended to use the Absorb Done Amps setting. DC loads cause the charger to increase amperage delivered to the battery bank in order to charge the batteries, plus run the DC loads. This scenario could result in overcharging the batteries since the return amps reading will be skewed by the DC loads.



Info: If a ME-BMK is installed in the system, Absorb Done is based on the reading in menu 04D DC Amps-BMK which is the most accurate DC amperage measurement. It is highly suggested to install a ME-BMK if Absorb Done Amps is used as the DC amps reading from the ME-BMK is accurate to +/- .1 ADC. If a ME-BMK is not installed in the system Absorb Done Amps is based on the reading in menu 01B DC Amps. The accuracy of menu 01B DC Amps is +/- 10A.

- **Set Absorb Done SOC** - This setting is used when the SOC (State of charge) of the battery bank is used to determine when the batteries are fully charged. SOC is the best way to determine when the batteries are fully charged. SOC also is helpful because any DC loads or other charge sources connected to the battery bank will not affect the SOC reading, and the batteries will always receive a full charge.

Default Setting: Absorb Done SOC = 100%



Info: The ME-BMK is required in ordered for the Absorb Done SOC setting to be used. If the Absorb Done SOC setting is selected and there is no ME-BMK installed in the system, then the Absorb Done will be based on the selection in 05B AmpHour Size.



Info: If Absorb Done SOC is used when charging from a generator source, then it is recommended that a setting of less than 100% be used (usually around 90% is acceptable). This lower setting is used because running the generator past the 90% setting is sometimes considered an inefficient use of fuel. If a lower setting than 100% is used, then at least once a week the batteries should be charged to 100%, to make sure damage is not done to the batteries by not bringing them to a full charge state.

3.0 Setup

- **03F Max Charge Time:** Max Charge Time is the maximum time the charger will operate in either the Bulk or Absorption mode. Once the charger reaches the Max Charge Time it will transition to the Final Charge Stage as set in 03G Final Charge Stage.

Default Setting: Max Charge Time = 12.0 Hours



Info: Set the Max Charge Time to a higher setting than the following menus in order to make sure a complete charge cycle is accomplished; 03E Absorb Done Time; 03E Absorb Done Amps; 03E Absorb Done SOC, and 04F Max Gen Run Time. Max Charge Time has priority over these menus and will stop the charge cycle when the Max Charge Time setting is satisfied.

Example: The Max Charge Time is set for 6.0 Hours, but menu 03E Absorb Done Time is set for 8.0 Hours. The charge cycle will stop after 6.0 Hrs as set by the Max Charge Time, and not finish the Absorb Done Time of 8.0 Hours

- **03G Final Charge Stage -** Final Charge Stage is the stage the charger will transition to after the Absorb Done stage as set in menu 03E Absorb Done. There are 3 choice for the Final Charge Stage; Multi-Stage, Float and Silent.



Info: Final Charge Stage is only used as the Final Charge Stage when Multi-charge is selected in menu 02 CHG Control.

Default Setting: Set Final Charge Stage = Multi

- **Set Final Charge Stage = Multi (Multi-Stage):** The Multi Final Stage transitions from the Absorb stage to Float. Once in the Float stage for 4 hours with no DC load on the batteries the charger will enter the "Full Charge" stage. In the "Full charge" mode the charger automatically goes into a standby mode (stops charging but is still on and active) and monitors the battery voltage. The charger will remain in the Full charge stage until the battery voltage drops below 12.7 VDC for 12v batteries, 25.4 VDC for 24-volt batteries and 50.8 VDC for 48-volt batteries at which time it will return to the Float stage. These battery voltages are the fully charged voltages of a battery at rest. The charger will continue to cycle between Float and Full charge as long incoming AC is available.



Info: The "Full charge" stage will help reduce water consumption during long charge cycles in flooded batteries. If another charge source such as PV or wind is charging the batteries above the fully charged voltage the charger will remain in the Full charge mode.

Why should I use the Multi-Stage? Multi-Stage is the most commonly used charge mode and is suitable for most applications and will assure a full charge to the batteries without overcharging. If there is another alternate charge source charging the batteries such as PV, wind or hydro then Multi mode will use the inverter/charger to complete a full charge. The inverter/charger will transition to Full Charge and then the alternate charge source will then maintain the battery voltage. If the alternate source is unable to maintain the voltage, the charger will enter float mode for another 4 hour period. The "Full Charge" feature in the Multi mode also helps reduce water consumption in flooded batteries when left in the charge mode for extended periods, such as in a backup power application.

- **Set Final Charge Stage = Float:** The Float Stage is a maintenance charge mode that maintains a constant voltage while delivering up to the maximum rated current of the charger in order to power any DC loads connected to the batteries. Most three stage chargers finish the charge mode in Float and remain in Float as long as an AC source is available on the input of the charger. The Float voltage is determined by the battery type selected in menu 03B Battery Type.

The difference between Float and Multi is that in the Float mode, there is no "Full Charge" mode, as described in the previous "Multi" section.

Why should I use the Float mode? Float mode is typically used when the charger is the only charge source connected to the batteries. This mode will maintain the batteries at the float voltage. If using flooded batteries and the charger is in float for an extended period the water level should be checked every two to three weeks for proper levels.

- **Set Final Charge Stage = Silent:** Silent mode stops charging once it transitions from Absorb mode to "Silent". Once the charger enters the Silent mode it will monitor the battery voltage and start charging once the batteries fall to the "DC Volts to Rebulk" setting. Once the batteries reach the "Set DC Volts to Rebulk" under 03G Final Charge Stage setting the charger will start the charge cycle over in the Bulk mode and then transition to Absorb. After the Absorb cycle the charger will again transition to the Silent mode and the charger will continue this cycle.

- **Set DC Volts to ReBulk -** When "Silent" mode is selected you must also set the DC voltage set point where the charger restarts the Bulk mode. This setting should be the lowest DC volts that you will allow the batteries to fall to before starting a new Bulk cycle. Typically the lowest DC volts the batteries are allowed to fall is 12.0 to 12.2VDC, (12-volt systems) 24.0 to 24.4VDC (24-volt systems) and 48.0 to 48.8VDC (48-volt systems) respectively.

Default Setting: Set DC Volts to ReBulk = 12.0

Why should I use the Silent mode? Silent mode is typically used when an alternate charge source is available, and able to fully charge or finish the charge cycle after the Absorb stage. A major difference between Multi mode and Silent is that Silent mode returns to the Bulk mode instead of Float mode. In Silent mode you can also adjust the Rebulk set point in order to allow the alternate charge source to provide more of the battery charging.

04 AGS Setup

This menu is used to setup only the functions related to the ME-AGS-N (Automatic Generator Start - Network version), which automatically starts and stops the generator on the following conditions:

- **Gen Run VDC** - starts and stops the generator based on battery voltage.
- **Gen Run Time** - starts and stops the generator based on time of day. This feature uses the ME-ARC clock to determine start and stop times.
- **Gen Run Amps** - starts and stops the generator based the AC amp load on the inverter in Invert mode.
- **Gen Run SOC** - starts and stops the generator based on the SOC reading from the ME-BMK.
- **Gen Run Temp** - starts the generator based on the interior temperature, or A/C thermostat and stops the generator after the set time.



Info: For detailed information on the ME-AGS-N, refer to it's Owner's Manual (part number: 64-00005).

3.0 Setup

SETUP 05 BMK:

The ME-BMK (Battery Monitor Kit) accurately measures the SOC (State Of Charge), battery voltage and DC amps of the battery bank.



Info: Refer to the ME-BMK Owner's Manual (part number: 64-0013) for detailed information on the ME-BMK.

3.2.5 TECH Button

The TECH menu button provides access to selections that are used to assist service technicians in troubleshooting. It provides access to system information along with a selection that allows all system settings to be returned to the original factory default values.

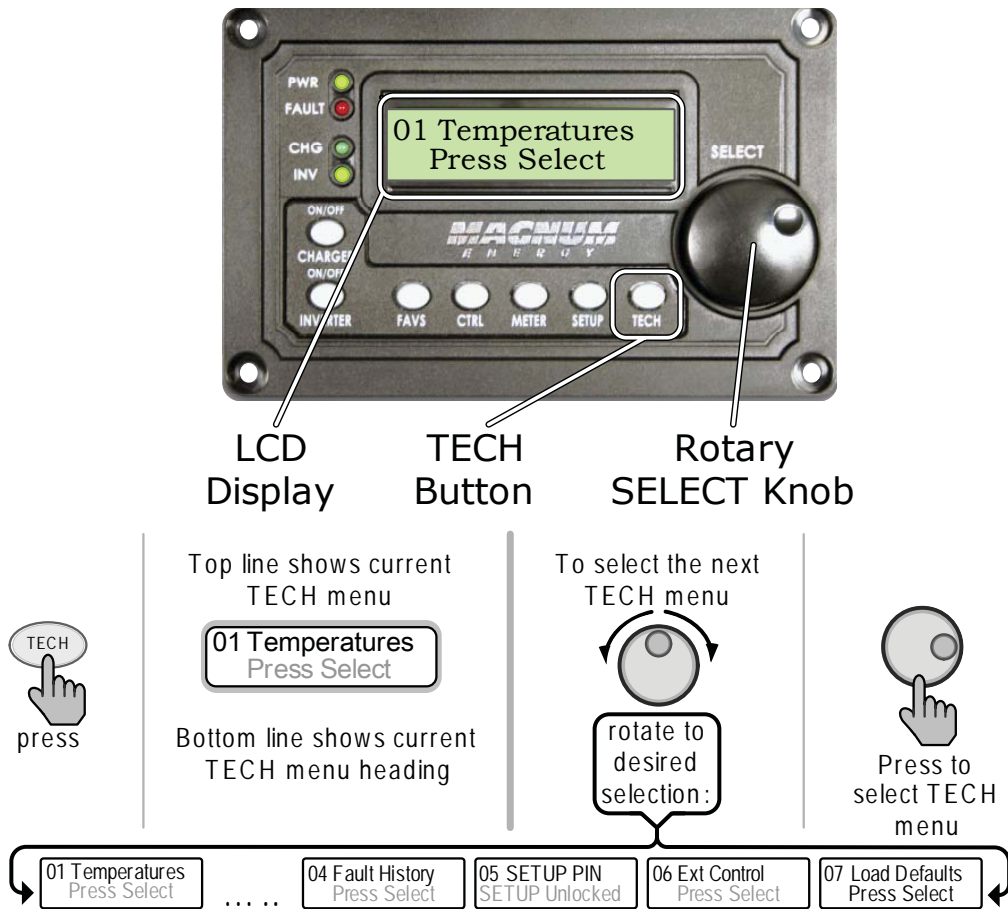


Figure 3-7, TECH Button

TECH: 01 Temperatures – Pressing the select knob will access the various temperatures measured throughout the system. Rotate the knob to scroll through the temperatures. Pressing the select knob will exit the temperature display. The following temperature displays are available:

- Batt Sensor- Battery Temp Sensor (BTS) connected to the battery bank.
- Transformer - main power transformer inside the unit.
- Transistors - FETs (Field Effect Transistors) inside the unit.
- AGS - temp sensor plugged into the remote port on the AGS module.



Info: The temperatures are displayed in Celsius or Fahrenheit as selected in Setup menu 01E Temp Display.

TECH: 02 Revisions – Pressing the select knob will access the revisions of the devices that are connected to the Magnum network. Rotate the knob to scroll through the revisions. Pressing the select knob will exit the display. The following devices display revisions: inverter, remote, AGS, BMK and router.



Info: BMK, AGS and the router accessory may display a “0.0” revision for several reasons. The accessory is not installed, there is no communication because of a bad or miswired network cable, the device is not powered or the device is bad.

If the ME-ARC is connected to a Router (ME-RTR), the Router revision will be displayed, but not all functions of the ME-ARC will be available. The ME-ARC has limited functions as a second remote connected to the Router.

Refer to the ME-RTR Router Owner’s Manual (part number: 64-0020) for a complete list of active menus when the ME-ARC is connected to the Router.

TECH: 03 Inv Model – This “read only” menu displays the model number of the connected inverter.



Info: When “03 Inv Model” displays “Unknown”, the remote is unable to determine the current inverter model. All remote menu selections and features that are supported by the inverter will function normally.



Info: When the ME-ARC is connected to inverters that are stacked in parallel or series there will be a stacking indication following the model number. The indications will indicate the following stacking conditions: “PM” Parallel Master; “PS” Parallel Slave; “SM” Series Master; “SS” Series Slave.

TECH: 04 Fault History - This menu displays a “History” of the last 9 inverter faults. Each fault is displayed along with: the day since the fault was recorded (H1), hours and minutes, status of the inverter just before the fault occurred, DC volts, DC amps, temperatures of the BTS, transformer and FETs.

All of this information can be useful in troubleshooting the inverter system and installation.

3.0 Setup

Example: The inverter has it's first fault today (D-) which is a Low Battery Fault at 10PM and then the next day (D-1) a High Battery Fault at 11PM. The Inv Fault History will display in order H1 = first fault in history, H2 = second fault in history etc.

H1 Low Battery	H2 High Battery
H1 D- 10:00PM	H2 D-1 11:00 PM
H1 Inverting	H2 Bulk Charge
H1 22 VDC 18A	H2 32 VDC 80A
H1 BTS: 60F	H2 BTS: 60F
H1 Tfmer: 65F	H2 Tfmer: 95F
H1 FETs: 65F	H2 FETs: 80C

- **TECH: 05 SETUP PIN:** This menu sets the password, locks and unlocks the "SETUP" button. The SETUP button can be locked with a password to avoid an unauthorized change.
- **Why should I use the PIN feature?** This feature is useful when the operation of the inverter has been set up by an experienced user or installer. Setting the PIN prohibits an inexperienced user from changing settings that might result in an undesirable operation.

Default setting: PIN = 0000

SETUP Unlocked - The SETUP button is unlocked, or has not been set for the first time and the SETUP menus are accessible.

When entering the menu if the PIN has not been set, "PIN = 0000" with the first "0" flashing will be displayed. When "PIN = 0000" is displayed, press the Select knob. The first "0" will be flashing, rotate the Select knob to the desired number 0-9 and press Select. Continue to set the remaining 3 digits until the desired PIN number is displayed. After pushing the Select for the last digit, the PIN is set and "Unlock SETUP <" is displayed.

When "PIN = 0****" is displayed a PIN has been entered, and the correct PIN must be entered in order to access the 05 SETUP PIN and SETUP buttons. If the incorrect PIN number is entered, "Invalid PIN" will be displayed. There is no limit on how many attempts can be made to enter the correct PIN number.

To enter the correct PIN number rotate the Select knob to the correct digit and then press Select. Continue to set the remaining 3 digits until the correct PIN number is entered. After pushing the Select for the last digit "Unlock SETUP <" will be displayed.



Info: If the correct PIN has been forgotten you may override the entered PIN. In menu 05 SETUP PIN when "PIN = 0****" is displayed, press and hold the Select knob until "PIN = 0000" is displayed. Enter a new PIN number as described in 05 SETUP PIN above.

Rotate the Select knob to access "Lock SETUP" and "Change PIN" options.

Unlock SETUP - When "PIN = 0***" is displayed, enter the correct PIN number and "SETUP *Unlocked*" will be displayed indicating the SETUP button is now unlocked. Press the SETUP button to access the SETUP menus.

Lock SETUP - When "SETUP *Unlocked*" is displayed rotate the Select knob to "Lock SETUP" and press Select. "SETUP Locked" will be displayed and the SETUP button is now locked.

Change PIN - When "SETUP *Unlocked*" is displayed, rotate the Select knob to "Change PIN", and then press Select. "PIN = xxxx" (xxxx = the current PIN number set) will now be display and is ready to accept a new PIN number.

Example - You have set your PIN number to "PIN = 1000". When Change PIN is selected "PIN = 1000" will be displayed. The first digit in this example (the "1") will be blinking. Turn the Select knob, change the first digit to the new PIN number you have selected. Continue to change the remaining 3 digits until you have selected your new PIN number.



Info: There are some SETUP menus that may be desirable to access without giving access to the PIN number to users. This is made possible in ME-ARC with the FAVS button. Before setting the PIN number, enter the desired SETUP menus in the FAVS button. Once the SETUP menus have been entered in the FAVS button the PIN number can now be entered and the SETUP button will be locked. The SETUP menus in FAVS will still be accessible without having to enter the PIN number. See pages 6-7 for more information on the FAVS button.

- **TECH: 06 Ext Control:** External Control is a read only menu. Magnum Energy has adopted an "open protocol" policy which allows third party firmware companies to control certain functions of the inverter/charger. This menu displays if any external software is controlling the remote. This menu is designed to help Magnum Energy tech support personnel determine if the inverter/charger is operating normally, or being controlled by a third party.

No Ext Control - This menu means that no third party network device is controlling the ME-ARC remote.

Yes Ext Control - This menu means that a third party network device is controlling one of the allowable functions of the ME-ARC remote. The function(s) that are being controlled by a third party will be displayed as a number. This number can be used by Magnum Tech Support to determine what code is controlling the ME-ARC remote.

- **TECH: 07 Load Defaults** - This menu restores all settings on the inverter/charger and any settings on accessories that are networked. To restore, press and hold the rotary SELECT knob for 5 seconds. After the default settings have been restored, the display will show DEFAULTS LOADED. Refer to the menu map on pages 34-37 for default values.



Info: For information on the factory default settings for any networked accessory; refer to the owner's manual for that accessory.

4.0 Menu Map

4.0 Menu Map: ME-ARC Remote Control

Figure 4-1 (four pages) is a complete overview of the remote and inverter/charger settings and info displays available in the ME-ARC; this should help with menu navigation.

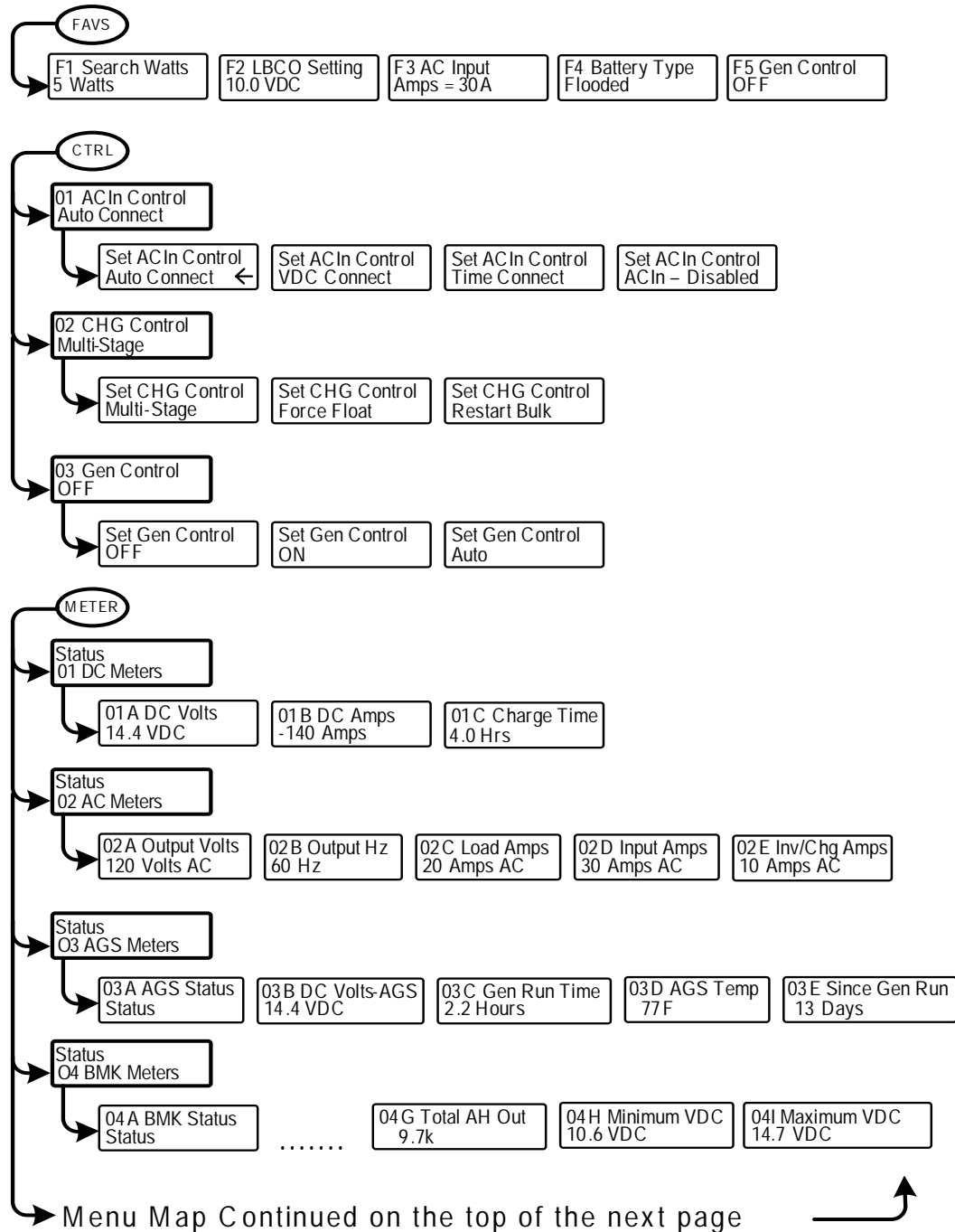


Figure 4-1, Inverter/Charger Menu Map (Page 1 of 4)

4.0 Menu Map: ME-ARC Remote Control (continued)

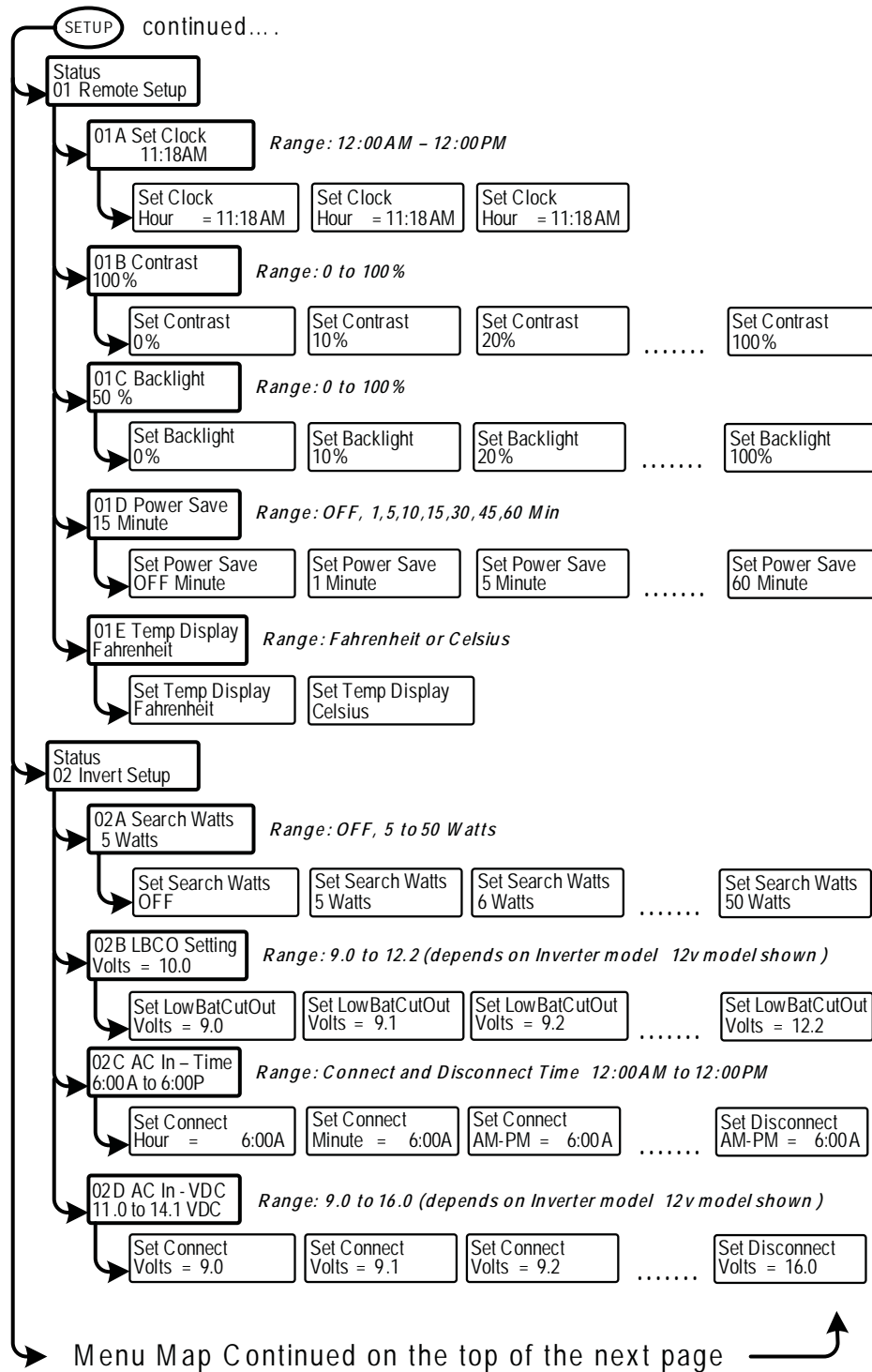


Figure 4-1, Inverter/Charger Menu Map (Page 2 of 4)

4.0 Menu Map

4.0 Menu Map: ME-ARC Remote Control (continued)

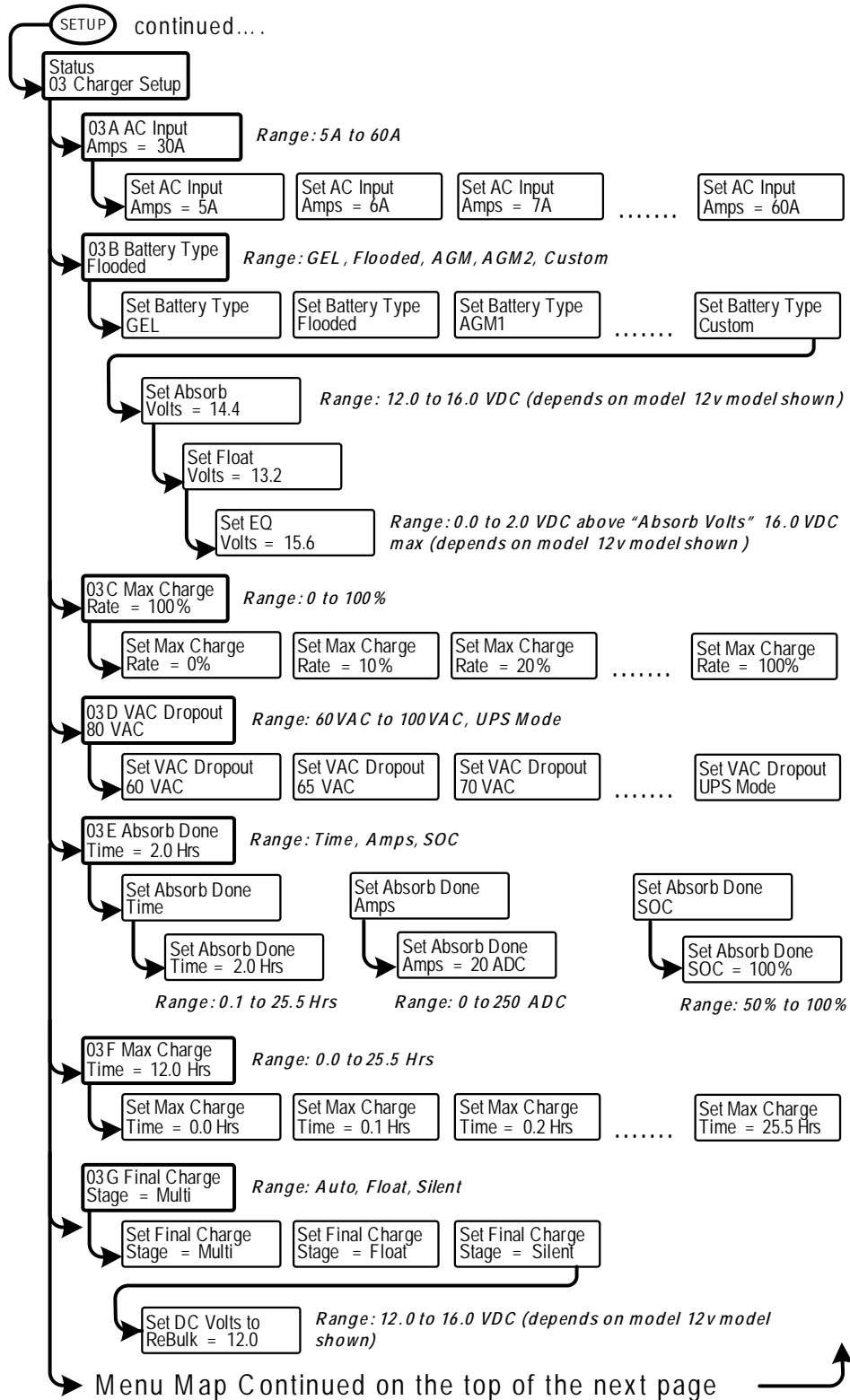


Figure 4-1, Inverter/Charger Menu Map (Page 3 of 4)

4.0 Menu Map: ME-ARC Remote Control (continued)

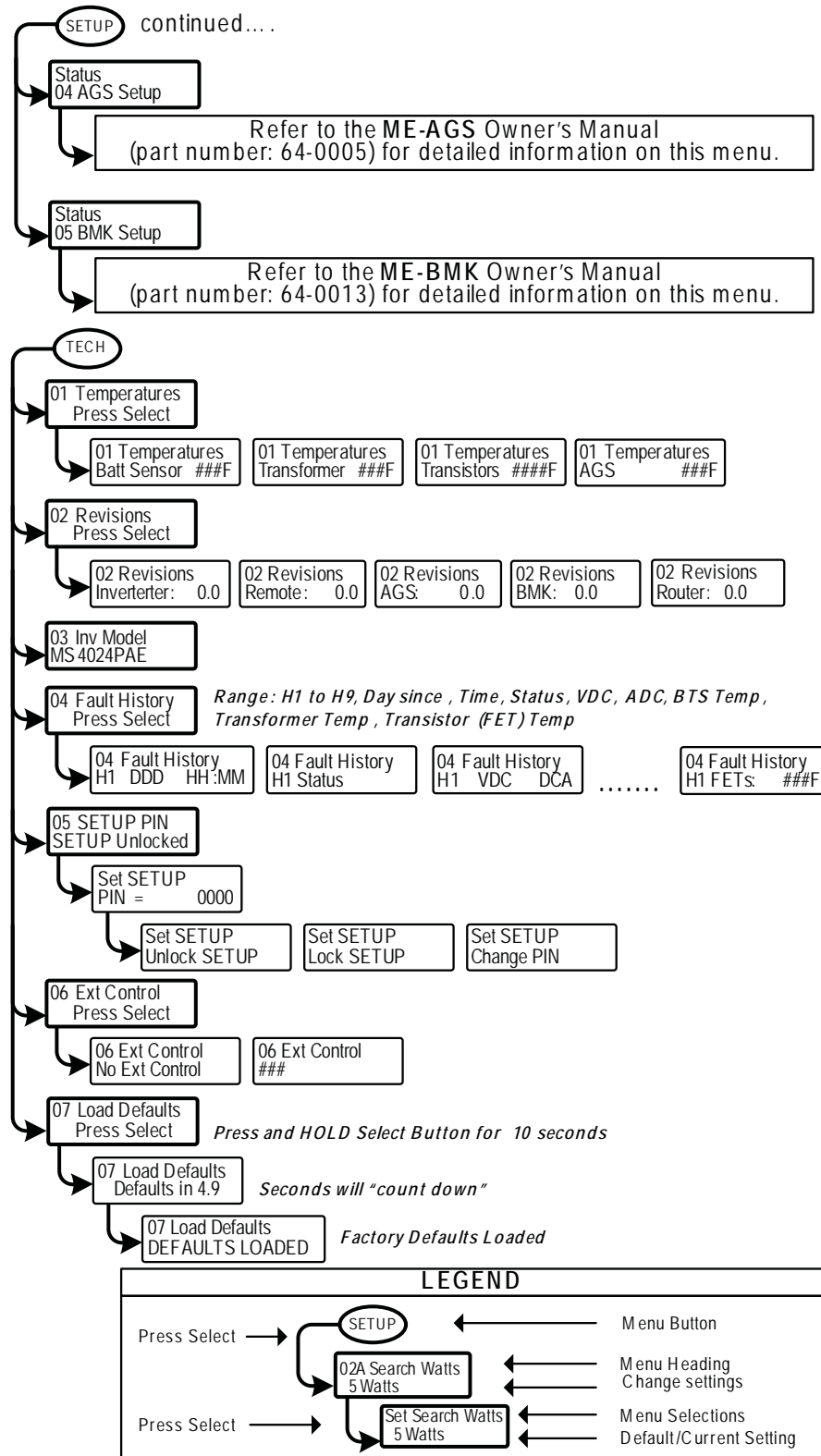


Figure 4-1, Inverter/Charger Menu Map (Page 4 of 4)

5.0 Operation

5.0 Operation

This section explains how to operate the inverter/charger with the ME-ARC remote. It also helps to explain the operational status determined by the LED indicators and LCD display.

5.1 Front Panel

The ME-ARC front panel contains LEDs and a LCD display for viewing system status; pushbuttons to control system operation; and a rotary knob that allows an easy way to select and find system information.

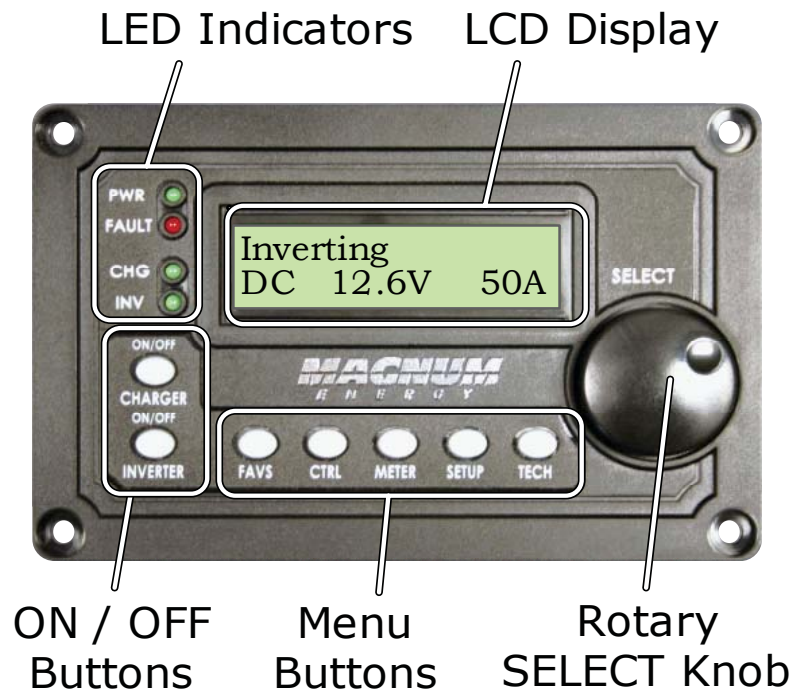


Figure 5-1, ME-ARC Front Panel Controls and Indicators

5.1.1 LED Indicators

There are four LED indicators on the front panel that light solid or blink to indicate the inverter/charger's status. When the remote is first powered-up, all the LED's come on as it goes through a self-test. Once the self-test is complete, the LED's along with the LCD provide the operating status of the inverter/charger. See section 5.3.4 for the LED Indicator Guide.

5.1.2 LCD Display

The LCD display is used for setting up the system operation, as well as viewing the current operating status or any fault condition. This display has two lines of alphanumeric characters and features a backlight that can be set to turn off to conserve power. The top line provides the inverter/charger status, which is detailed in this section. The bottom line displays battery information while using the METER menu, system troubleshooting information while in the TECH menu, and menu items that can be configured for your specific system operation while in the SETUP menu. This display automatically powers up with the current system status on the top line and the Home Screen (detailing the inverter's DC voltage and current as shown in Figure 5-1) on the bottom line.

5.1.3 ON/OFF Pushbuttons

- **ON/OFF INVERTER:** This button toggles the inverter function on and off. The green "INV" LED turns on and off with the button.
- **ON/OFF CHARGER:** This button toggles the charger function on and off whenever the charger is actively charging. The green "CHG" LED turns on and off with this button. This button is also used to initiate an equalize charge; for more information on using the equalize charge feature, see section 5.2.2 and the Equalizing Mode information on page 46.

5.1.4 Menu Pushbuttons

These five menu pushbuttons provide quick access to menu items that can help with configuring, monitoring and troubleshooting your inverter/charger system.

- **FAVS:** This menu button allows 5 "menu items" to be stored for quick access to these items without having to find them within the SETUP or other control buttons. The 5 items stored under the FAVS button become the "favorites" menus that are most often used.
- **CTRL:** The CTRL menu button contains the menus for "ACIN CONTROL", "CHG CONTROL" AND "GEN CONTROL". The CTRL button gives you quick control of the main functions of the inverter/charger.
- **METER:** This button provides meter information on the inverter/charger, ME-AGS-N and ME-BMK; see section 3.2.3 for more detailed information.
- **SETUP:** This button allows the inverter/charger, ME-AGS-N and ME-BMK to be configured to your specific system preferences; see section 3.2.4 for more detailed information.
- **TECH:** This button allows you to access menu selections that can help service personnel with troubleshooting and also allows the factory default setting to be restored; see section 3.1.0 for more detailed information.

5.1.5 Rotary SELECT Knob

The Rotary 'SELECT' knob is similar to a dash radio knob and used to easily view and select various menu items and settings displayed on the LCD screen. Turn the rotary knob clockwise and counterclockwise to view the different menu items, and available inverter/charger, ME-AGS-N and ME-BMK settings. Push or "SELECT" the rotary knob to enter a menu item or to "save" a setting once it is displayed on the LCD screen.



Info: All adjustable inverter/charger settings in the ME-ARC (except for 01B Contrast, 01C Backlight and 03 AGS Control - which revert back to default) are saved in non-volatile memory and are preserved until changed - even if an inverter reset is performed, or if all power to the remote or inverter is removed.



Info: The LCD display can be refreshed by holding down the SELECT knob for 10 seconds.



CAUTION: An accessory that is networked to the inverter may have adjustable settings that revert back to default if all power to the inverter is lost. Refer to the operation manual for the particular accessory to determine if any setting for the accessory is affected.

5.0 Operation

5.2 Operating the Inverter/Charger

5.2.1 Inverter Mode

Turning the inverter on: Press the ON/OFF INVERTER button to activate the inverter function. The inverter will either be actively “Inverting” by using power from the batteries to power the AC loads (see Figure 5-4); or will be “Searching” for a load by using very little power from the batteries, if in Search mode (see Figure 5-3). The green ‘INV’ LED will be on when the inverter is actively Inverting and the green ‘INV’ LED will flash while searching.

Turning the inverter off: While the inverter is actively “Inverting” or “Searching”, the ON/OFF INVERTER button can be pressed to switch the inverter function off, and this will turn the green ‘INV’ LED off (see Figure 5-2).

Inverter Standby: The inverter is in standby when the inverter is active (green ‘INV’ LED is on) and an external AC power (utility/shore or generator) is passing through the inverter to power the AC loads. During normal operation, the AC loads will be powered by the external AC power, however, if a blackout or brownout condition occurs, the inverter senses these conditions, transfers to inverter mode and powers the AC loads connected to the inverter.



CAUTION: If you have critical loads and are in Inverter Standby, do not press the ON/OFF INVERTER button to turn the inverter function off. If the green ‘INV’ LED is off, inverter power will NOT be available to run your critical loads if the external AC power is interrupted.

5.2.2 Charger Mode

Turning the Charger on: The charger will automatically be activated and begin to charge your batteries when acceptable AC power (utility or generator) is connected to the input (HOT IN 1) of the inverter. When the charger is ON, it produces DC voltage and current to charge your batteries. The CHG LED will be solid when the charger is ON and actively charging. While charging the display will show Bulk, Absorption, Float, Full charge or Silent (see Figures 5-5 thru 5-9).

Charger Standby: While the charger is actively charging, the ON/OFF CHARGER button can be pressed to switch the charger to “Charger Standby”. While in Charger Standby, the incoming AC is still available on the inverter’s output, but the charger is not allowed to charge. The display will show ‘Charger Standby’ and the CHG LED will flash (see Figure 5-10).



Info: To resume charging, momentarily press the ON/OFF CHARGER button; or disconnect/reconnect AC power to the inverter’s input.

Equalize charging: Equalizing is a “controlled over charge” performed after the batteries have been fully charged. It helps to mix the battery electrolyte (to reverse the buildup of stratification), and also helps to remove sulfates that may have built up on the plates. These conditions, if left unchecked will reduce the overall capacity of the battery.



WARNING: Do not perform an Equalization charge without reading and following all safety precautions pertaining to charging/equalization as noted in this manual, and any equalization information in the inverter’s manual.

To enable the Equalization charge; see Figure 5-11 and follow all related information on page 46.

5.3 System Status Messages

The remote control uses the top line of the LCD display to show the inverter/charger's current operation by displaying a status message. This section will show the inverter/charger's operating modes and the available status messages under each mode. Use these status messages along with the Status LED's to determine the inverter/charger's current operating status, and to help troubleshoot the system if a fault occurs.

There are three operating modes of the inverter/charger:

- Inverter Mode
- Charger Mode
- Fault Mode

5.3.1 Inverter Mode Messages

The inverter/charger will be in the Inverter Mode when AC power (utility or generator) is not available or unacceptable to the inverter/charger's input. The Inverter Mode messages are Off, Searching, Inverting and Standby.

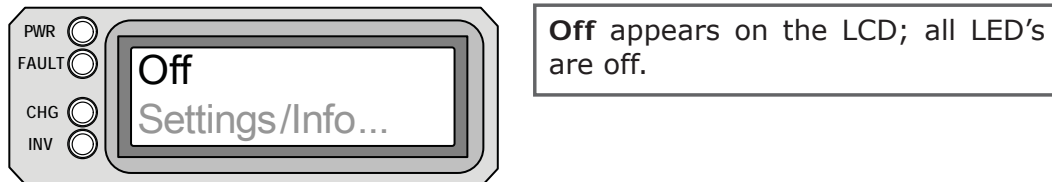


Figure 5-2, Off Mode

- **Off** – This message tells you that there is no AC available on the inverter's AC output. The inverter function is off and there is no utility or generator AC power sensed on its input.

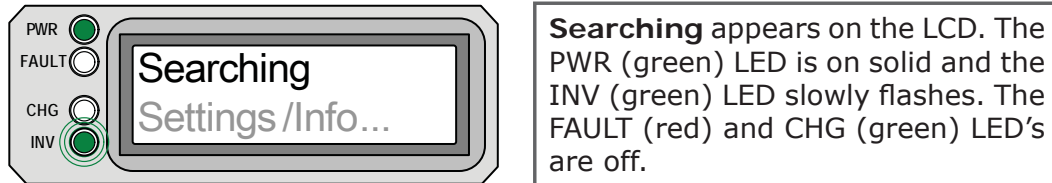


Figure 5-3, Searching Mode

- **Searching** – The inverter is in the Search mode, which means the AC loads on the inverter output are less than the Setup 02A Search Watts. The Search mode function is used to reduce the inverter draw from the battery and may be turned off at any time, if you want full inverter output voltage available at all times (see the 02 Invert Setup section on page 20).

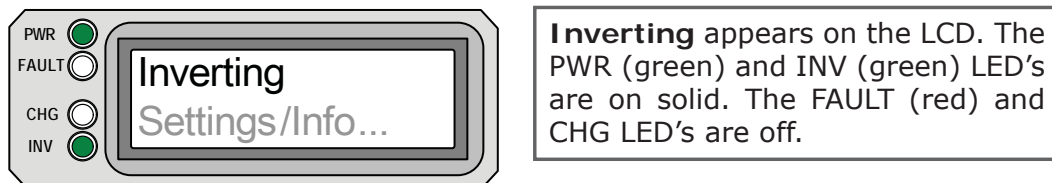
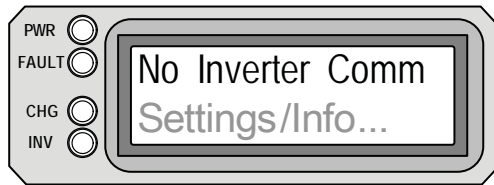


Figure 5-4, Inverting Mode

- **Inverting** – The inverter is providing AC voltage on its output by Inverting power from the batteries.

5.0 Operation



No Inverter Comm appears on the LCD; all LED's are off.

Figure 5-5, No Inverter Communication Mode

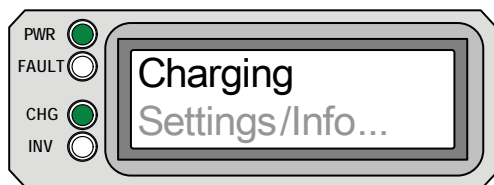
- **No Inverter Comm** - The ME-ARC is not communicating with the inverter/charger. The ME-ARC uses a standard telephony wired cable and is receiving power and ground from the inverter/charger to power up, but the transmit and receive wires are not working. Try a different remote cable or standard phone cable.

5.3.2 Charger Mode Messages

When AC power (utility or generator) is connected to the inverter/charger, it begins to monitor the AC input for acceptable voltage. Once the AC input is accepted, the AC transfer relay (inside the inverter) closes and charge mode begins. There are several Charger Mode messages; view the top line of the LCD display and the corresponding message in this section to determine and understand the particular Charger Mode.



Info: The AC input becomes acceptable after a minimum 10 second delay, and when the voltage is greater than the Setup 03D VAC Dropout setting.



Charging appears on LCD; PWR (green) and CHG (green) LED's are on solid; FAULT (red) LED is off and INV (green) LED could be on or off.

Figure 5-6, Charging Mode

- **Charging** - Once the charger mode has been enabled, the unit will wait and display "Charging" to determine the charge routine. If the DC voltage is low (≤ 12.8 VDC / 12-volt models, ≤ 25.6 VDC / 24-volt models, or ≤ 51.2 VDC / 48-volt models), the charger will initiate "Bulk Charging". If the DC voltage is high (≥ 12.9 VDC / 12-volt models, ≥ 25.6 / 24-volt models or ≥ 51.2 / 48-volt models), the charger will skip the Bulk and Absorb charging stages and go directly to Float Charging.

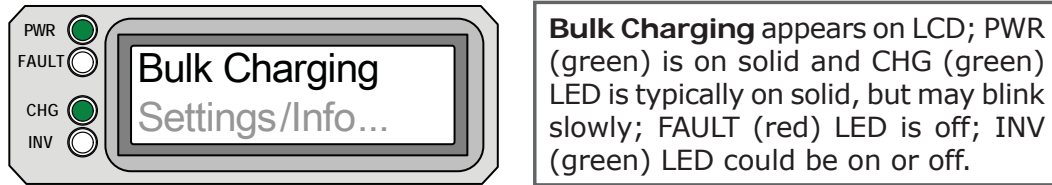


Figure 5-7, Bulk Charging Mode

- **Bulk Charging** – The battery charger is delivering maximum current (determined by the Setup 03C Max Charge Rate setting) to the batteries. The charger will remain in Bulk charge until the absorb voltage (determined by the Setup 03B Battery Type setting) is achieved.

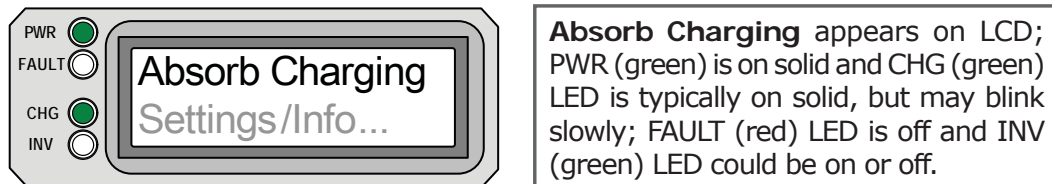


Figure 5-8, Absorb Charging Mode

- **Absorb Charging** - The Absorb charge state is the constant voltage stage and begins when the absorb voltage is reached (determined by the Setup 03B Battery Type setting) while Bulk Charging. During this stage, the DC charging current decreases in order to maintain the absorb voltage setting. This charge stage continues until 03E Absorb Done (Time, Amps or SOC) or 03F Max Charge Time is reached.

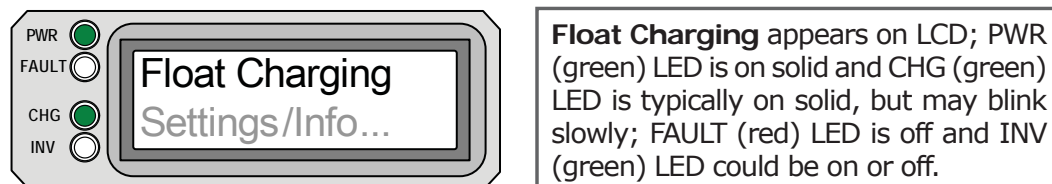


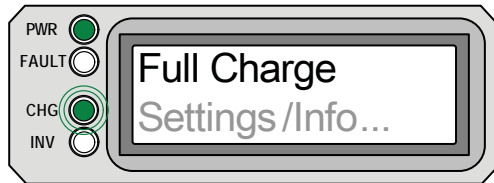
Figure 5-9, Float Charging Mode

- **Float Charging** – At the end of the Absorb Charge time, the charger reduces the charge voltage and tries to maintain the batteries at the Float charge voltage setting; which is determined by the Setup 03B Battery Type setting as shown in Table 3-3, Battery Type to Charge Voltages.



Info: If the battery voltage falls ≤ 12.1 VDC (12-volt models), ≤ 24.2 VDC (24-volt models) or ≤ 48.4 VDC (48-volt models); the unit will initiate bulk charging.

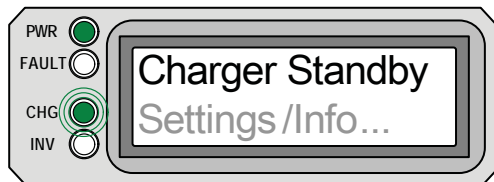
5.0 Operation



Full charge appears on LCD; PWR (green) LED is on solid and CHG (green) LED blinks slowly; FAULT (red) LED is off and INV (green) LED could be on or off.

Figure 5-10, Full Charge Mode

- **Full charge** - This status indicates that you have entered the Battery Saver™ mode. This mode maintains the batteries without overcharging, thus preventing excessive loss of water in flooded batteries or drying out of GEL/AGM batteries. After 4 hours "Float Charging", the charger will turn off and "Full charge" is displayed (charger is now in Battery Saver™ mode). If the battery voltage drops to ≤ 12.6 (12-volt models), ≤ 25.2 (24-volt models) or ≤ 50.4 (48-volt models); the charger will automatically initiate another 4 hours "Float Charging". This cycle helps to ensure the batteries are maintained; and continues as long as AC power is continuously connected to the AC input.



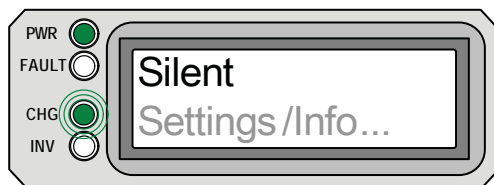
Charger Standby appears on LCD; PWR (green) LED is on solid and CHG (green) LED slowly blinks; FAULT (red) LED is off and INV (green) LED could be on or off.

Figure 5-11, Charger Standby Mode

- **Charger Standby** - This means the charger has been disabled to prevent any charging, but the AC power (from utility or generator) to the AC input is still available on the AC output. This display is shown when the ON/OFF CHARGER button is pressed while the AC power is passing through the inverter/charger.



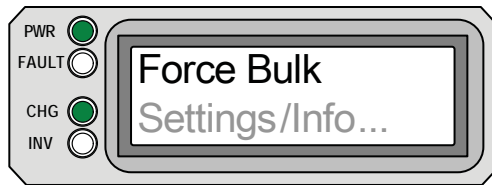
Info: To enable charging again, press the ON/OFF CHARGER button. When the charger is enabled, the charger will continue in the charge mode it left and the CHG (green) LED will come on solid.



Silent appears on LCD; PWR (green) LED is on solid and CHG (green) LED slowly blinks; FAULT (red) LED is off and INV (green) LED could be on or off.

Figure 5-12, Silent Mode

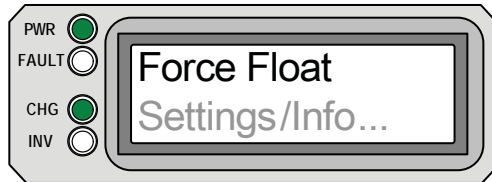
- **Silent** - This will display at the end of Absorption stage if Silent is selected in menu 03G Final charge stage Silent mode. In Silent mode the charger is not actively charging but it does monitor the battery voltage. When the battery voltage reaches the "Set DC Volts to ReBulk" setting in menu 03G Final Charge Stage the charger will restart a Bulk and Absorb charge cycle, and then transition back into the Silent mode at the end of the Absorb cycle.



Force Bulk appears on LCD; PWR (green) LED is on solid and CHG (green) LED is typically on solid, but may blink slowly; FAULT (red) LED is off and INV (green) LED could be on or off.

Figure 5-13, Force Bulk Mode

- **Force Bulk** – This selection restarts the Bulk cycle from any stage in the charge cycle. Restarting the Bulk stage is useful when a full Multi-stage charge cycle does not bring the specific gravity of the batteries to the proper level.



Force Float appears on LCD; PWR (green) LED is on solid and CHG (green) LED blinks slowly; FAULT (red) LED is off and INV (green) LED could be on or off.

Figure 5-14, Force Float Mode

- **Force Float** – This charge profile “forces” the charger to stay in the Float mode continually as long as AC is present and the charger is active. Force Float is most often used when another source of charging such as PV, wind or hydro is available to keep the batteries at the Float voltage. If AC is disconnected and then reconnected, the charger will go directly to the Float mode and will not do a Bulk or Absorption charge cycle.

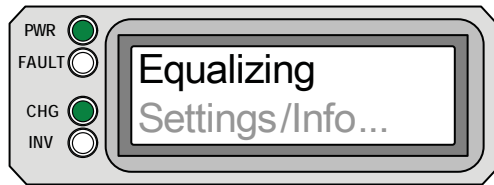


Info: If the battery voltage falls ≤ 12.1 VDC (12-volt models), ≤ 24.2 VDC (24-volt models) or ≤ 48.4 VDC (48-volt models); the unit will automatically begin Bulk Charging.



CAUTION: Using the Force Float mode may not fully charge the batteries. Most batteries require a Bulk and Absorption charge cycle in order to fully recombine the electrolyte in the batteries and bring the specific gravity to the proper level. Be sure to check with your battery manufacturer before using this setting.

5.0 Operation



Equalizing appears on LCD; PWR (green) and CHG (green) LED's are on solid; FAULT (red) LED is off and INV (green) LED could be on or off.

Figure 5-15, Equalizing Mode

Equalizing - The battery charger is delivering the equalize voltage to the batteries; see Table 3-3, *Battery Type to Charge Voltages* to determine the equalize voltage for your battery type.

Equalize charging can be enabled by the ON/OFF CHARGER button - if the Setup 03B Battery Type selection allows. Equalization charging can only be enabled while the charger is in Float charge or in Full Charge mode. To turn on equalize charging, ensure the LCD display reads "Float Charging" or "Full charge", then press and hold the ON/OFF CHARGER button down (about 5 seconds) until the LCD screen displays "Equalizing".

The equalize charge will continue for 4 hours and then automatically stop and return to "Float Charging". The equalize charge can be manually stopped by pressing and holding the ON/OFF CHARGER button down (about 5 seconds) until the LCD screen displays "Float Charging".

During Equalize charge mode the batteries will begin gassing and bubbling vigorously which consumes water. Ensure each cell has adequate distilled water levels prior to equalizing, and add water as needed after equalizing.

How often should I equalize? Some experts recommend that heavily used batteries should be equalized periodically, ranging anywhere from once a month to once or twice per year. Other experts only recommend equalizing when the cells have a low specific gravity, or when the difference between any individual cell has a specific gravity reading greater than .015 after being fully charged. Contact your battery manufacture for their recommendations.

How long should I equalize? While the batteries are gassing, monitor the specific gravity readings every hour; when the specific gravity readings no longer increase, the equalization charge is complete and should be stopped.



WARNING: Equalizing produces hydrogen and oxygen gas. Ensure the battery compartment has adequate ventilation in order to dissipate this gas to avoid explosions.



CAUTION: Ensure your batteries can be equalized. Only equalize your batteries if permitted by your battery manufacturer or dealer. Performing an equalize charge on batteries other than liquid lead acid or certain AGM types could permanently damage them. Refer to your battery manufacturer/dealer for instructions on how to properly equalize your batteries.



CAUTION: Ensure the DC loads will not be damaged by the higher voltage applied to the batteries during the equalize charge. If in doubt, disconnect the DC loads to prevent damage.



Info: Equalization charging is not available if GEL or AGM 2 is selected under *Setup 03B Battery Type* menu.

5.3.3 Fault Mode Messages

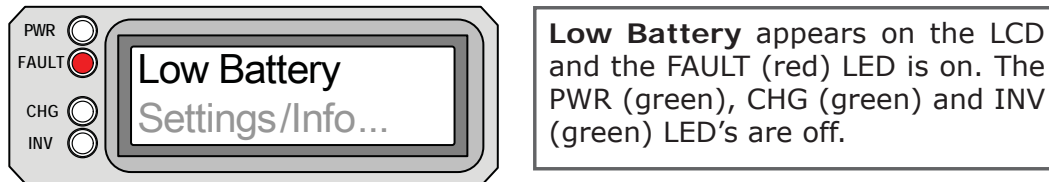
The fault LED comes on and a fault status is displayed when an abnormal condition is detected. View the LCD display and the information in this section to determine and correct the issue.



Info: Many of the faults will automatically restart when the fault is cleared. Some faults will require a manual restart; this requires the ON/OFF INVERTER button on the remote to be pressed and released. Finally, if the fault is unable to clear, an inverter reset may be required - see section 6.2 to perform an inverter reset.

5.3.3.1 System Fault messages -

These fault messages are usually caused by some external issue that directly affects the inverter/charger system.



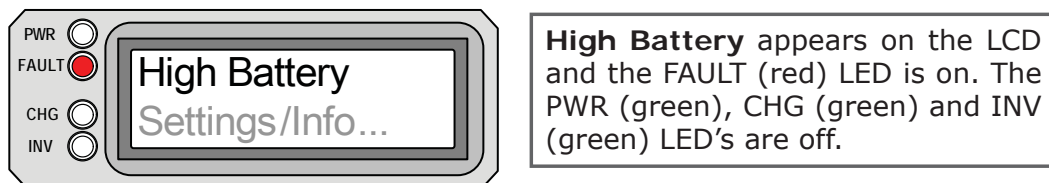
Low Battery appears on the LCD and the FAULT (red) LED is on. The PWR (green), CHG (green) and INV (green) LED's are off.

Figure 5-16, Low Battery Fault

- **Low Battery** – The inverter has turned off to help prevent the batteries from being over-discharged. This message is displayed and the FAULT (red) LED illuminates when the battery voltage drops below the Setup 02B LBCO setting for more than 1 minute. The inverter will automatically restart and resume operation when the battery voltage rises to ≥ 11.0 VDC (12-volt models), ≥ 25.0 VDC (24-volt models), or ≥ 50.0 VDC (48-volt models).



Remedy: This fault will also automatically restart if AC power such as utility power or a generator is connected to the inverter/charger's input and battery charging begins.



High Battery appears on the LCD and the FAULT (red) LED is on. The PWR (green), CHG (green) and INV (green) LED's are off.

Figure 5-17, High Battery Fault

- **High Battery** – The inverter has turned off because the battery voltage is at a very high level. This fault message is displayed and the FAULT (red) LED will be on when the battery voltage is above the High Battery Cut-Out (HBCO) value. This fault will automatically restart and resume operation when the battery voltage drops 0.3 VDC (12-volt models), 0.6 VDC (24-volt models), or 1.2 VDC (48-volt models) below the HBCO value.

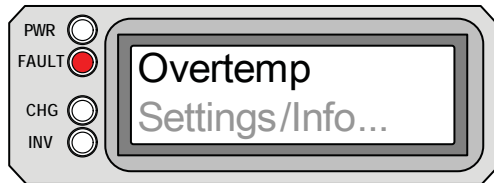


Info: The HBCO value is dependent on your inverter revision and model. Normally, the HBCO value for the ME/MM/RD Series Inverters is 16 VDC (12-volt models) or 32 VDC (24-volt models); and the HBCO value for the MS/MMS Series Inverters is 17 VDC (12-volt models), 34 VDC (24-volt models), or 68 VDC (48-volt models).



Remedy: This fault usually only occurs when an external DC charging source is charging the inverter's battery bank. Turn off any other additional charging source to allow the DC voltage level to drop.

5.0 Operation



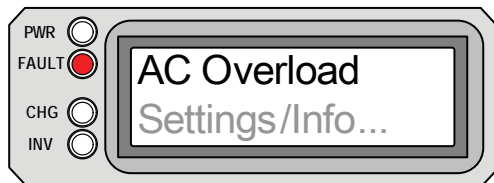
Overtemp appears on the LCD and the FAULT (red) LED is on. The PWR (green), CHG (green) and INV (green) LED's are off.

Figure 5-18, Overtemp Fault

- **Overtemp** – This fault message indicates the inverter/charger has shut down because the internal power components (FET's and/or Transformer) have exceeded their safe temperature operating range. When the unit has cooled down, it will automatically restart and continue operation.



Remedy: If the fault occurs while inverting, reduce the load on the inverter; if it occurs while charging, turn down the charge rate. If this fault happens often, ensure the inverter is not in a hot area, has proper ventilation, and the cooling fans inside the inverter are working.



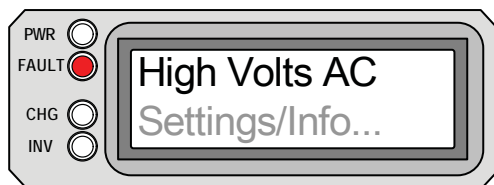
AC Overload appears on the LCD and the FAULT (red) LED is on. The PWR (green), CHG (green) and INV (green) LED's are off.

Figure 5-19, AC Overload Fault

- **AC Overload** - This fault message displays when the AC load on the inverter/charger's output has exceeded the inverters AC current protection limits. If the overload condition lasts for less than 10 seconds, the unit will, automatically restart and resume operation. However, if the overload occurs more than 10 seconds, the unit will shut down and require a manual restart.



Remedy: This fault usually occurs because the connected AC loads are larger than inverter's output capacity, there is a wiring short on the output or the output, wires are incorrectly wired. Once the AC loads are reduced, or the output wiring is corrected; the inverter can be restarted after a manual restart has been accomplished.



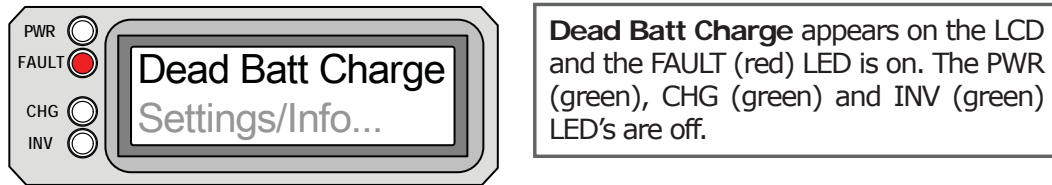
High Volts AC appears on the LCD and the FAULT (red) LED is on. The PWR (green), CHG (green) and INV (green) LED's are off.

Figure 5-21, High Volts AC Fault

- **High Volts AC** - This fault causes the AC Input to be disabled because a very high AC voltage (>150 VAC; or >300 volts for Export inverters) has been detected on the AC input.



Remedy: Remove all AC power from the inverter's AC input for at least 15 minutes to automatically restart this fault; ensure only 120VAC power is connected to each of the inverter's AC inputs.



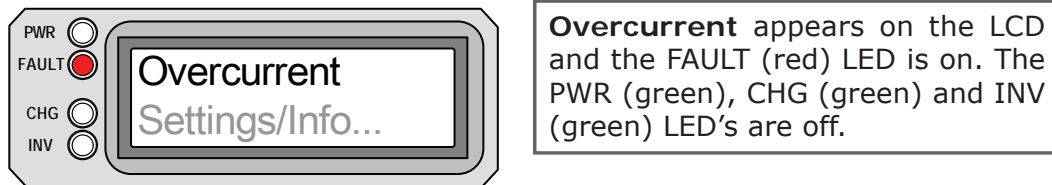
Dead Batt Charge appears on the LCD and the FAULT (red) LED is on. The PWR (green), CHG (green) and INV (green) LED's are off.

Figure 5-22, Dead Battery charge Fault

- **Dead Battery charge** – This fault has detected a very discharged battery bank or a battery bank that is disconnected from the inverter. The unit is attempting to enter the charge mode, but has detected less than 7 volts (12-volt models), 14 volts (for 24-volt models) or 28 volts (for 48-volt models) on the battery bank. This fault will continue until current is able to flow into the battery from the battery charger. Once this happens, the fault will automatically reset.



Remedy: Check the DC voltage on the inverter's DC terminals and compare it with the DC voltage on the battery bank, these two voltages should be very close (<0.5 VDC difference). If not, check to ensure all connections are tight and the fuse/circuit breaker between the inverter and battery bank is good.



Overcurrent appears on the LCD and the FAULT (red) LED is on. The PWR (green), CHG (green) and INV (green) LED's are off.

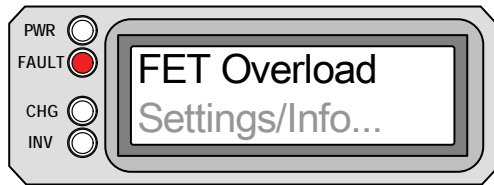
Figure 5-23, Overcurrent Fault

- **Overcurrent** - This fault causes the inverter to shut down to protect internal power components and may be caused by an excessive AC load. If the overload condition lasts for less than 10 seconds, the unit will automatically restart and resume operation. However, if the overcurrent condition occurs, more than 10 seconds, the unit will shut down and will require a manual restart.



Remedy: This fault usually occurs because the connected AC loads are larger than the inverter's output capacity, there is a wiring short on the AC output, or the wires are incorrectly wired. Once the AC loads are reduced or the output wiring is corrected; manually restart the inverter to resume operation. If this fault condition continues after all of these recommendations, perform a inverter reset (see section 6.2).

5.0 Operation



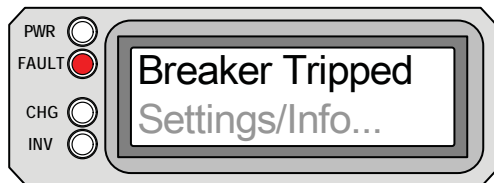
FET Overload appears on the LCD and the FAULT (red) LED is on. The PWR (green), CHG (green) and INV (green) LED's are off.

Figure 5-24, FET Overload Fault

- **FET Overload** - This fault message indicates the inverter/charger has shut down because the internal FET's (Field Effect Transistor's) have quickly exceeded a safe operating temperature. When the FET's have cooled, the unit will require a manual restart to resume operation.



Remedy: If the fault continues to occur, disconnect all the inverter's AC output wires and reset the inverter (see section 6.2). If this fault does not clear after doing a reset, the inverter may require service.



Breaker Tripped appears on the LCD and the FAULT (red) LED is on. The PWR (green), CHG (green) and INV (green) LED's are off.

Figure 5-25, Breaker Tripped Fault

- **Breaker Tripped** - The inverter has detected that the AC input breaker on the inverter/charger has opened due to excess current flow thru the inverter to the AC loads.



Remedy: After reducing the AC loads, push in the inverter's AC input circuit breaker to reset and resume operation.



Info: While in Charger Mode, the inverter's AC input breaker could nuisance trip if the loads on the inverter's AC HOT OUT 1 exceed the current rating of this circuit breaker.



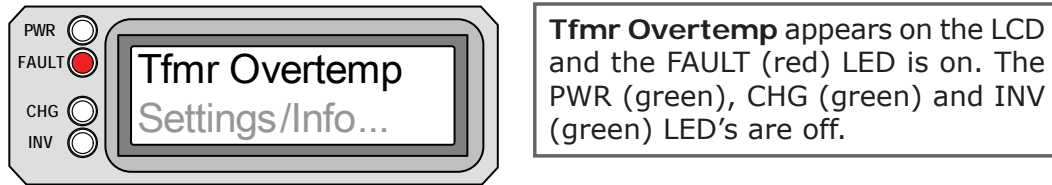
Unknown Fault appears on the LCD and the FAULT (red) LED is on. The PWR (green), CHG (green) and INV (green) LED's are off.

Figure 5-26, Unknown Fault

- **Unknown Fault** - This fault message displays when the inverter/charger has sent a fault code that cannot be determined by the remote.



Remedy: Call the Technical Support department at Magnum Energy for assistance to help determine and understand the actual fault status.



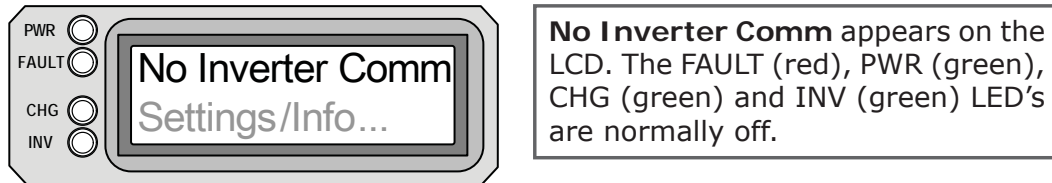
Tfmr Overtemp appears on the LCD and the FAULT (red) LED is on. The PWR (green), CHG (green) and INV (green) LED's are off.

Figure 5-27, Tfmr Overtemp Fault

- **Tfmr Overtemp** - This fault message is displayed when the TCO (Temperature Cut-Out) opens and causes the inverter to shut down to protect the internal power transformer from damage. When the TCO has cooled down, the inverter will automatically restart and resume operation.



Remedy: If the fault occurs while Inverting, reduce the load on the inverter; if it occurs while charging, turn down the charge rate. If this fault occurs often, ensure the inverter is in a cool location, has adequate ventilation, and the internal cooling fans are operational.



No Inverter Comm appears on the LCD. The FAULT (red), PWR (green), CHG (green) and INV (green) LED's are normally off.

Figure 5-29, No Inverter Comm

- **No Inverter Comm** - This fault message indicates that the remote is no longer receiving any communication data via the Magnum Network.

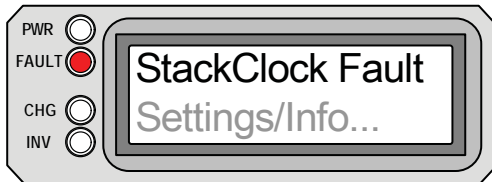


Remedy: Reset the remote by disconnecting the remote communications cable from the inverter for 5 seconds and then reconnect (see Figure 2-3). If the fault continues, check/replace the remote cable.

5.0 Operation

5.3.3.2 Stacking Fault Messages –

A fault condition may occur when two Inverters are stacked in series - using the stacking interface to provide 120/240VAC output - that is not possible on a single inverter installation. Refer to the following fault messages to help troubleshoot the Inverters.



StackClock Fault appears on the LCD and the FAULT (red) LED is on. The PWR (green), CHG (green) and INV (green) LED's are off.

Figure 5-30, StackClock Fault

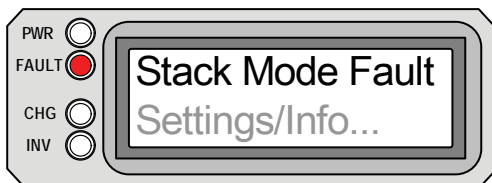
- **StackClock Fault** - 1. There is a stacker cable problem; or, 2. One inverter is losing synchronization with the other inverter.



Remedy: 1. Ensure you are using a Magnum Stacking Cable (this is not a telephone/data cable, this is a custom made cable). 2. Inspect the stacker cable and reconnect at both ends (listen and make sure you hear an audible "click" from the connectors at both Inverters).



Info: This fault has been known to occur when a Magnum Energy accessory is plugged into the Stack Port, but the installation is not using multiple Inverters in a stacked configuration. If this occurs, perform an [inverter reset](#) (see section 6.2).



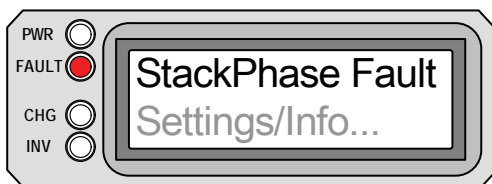
Stack Mode Fault appears on the LCD and the FAULT (red) LED is on. The PWR (green), CHG (green) and INV (green) LED's are off.

Figure 5-31, Stack Mode Fault

- **Stack Mode Fault** - This unit has detected a problem with the "other" stacked inverter, check that unit for a fault condition.



Remedy: This fault will automatically clear when the fault with the [other inverter](#) is corrected.



StackPhase Fault appears on the LCD and the FAULT (red) LED is on. The PWR (green), CHG (green) and INV (green) LED's are off.

Figure 5-32, StackPhase Fault

- **StackPhase Fault** - 1. The AC input wiring is incorrect; or, 2. One phase was lost from the AC input source; or, 3. One of the inverter's internal transfer relay is bad; or, 4. The inverter's AC input circuit breaker may be open.



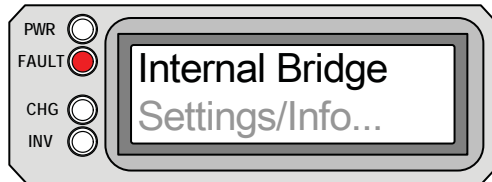
Remedy: If this fault doesn't clear after checking these four recommendations; perform an [inverter reset](#) (see section 6.2).

5.3.3.3 Internal Fault Messages -

The inverter continually monitors several internal components. If an condition inside the inverter occurs that does not allow proper operation, the inverter will shut down to help protect itself. To clear these "internal" type of faults, the inverter will require an inverter reset.



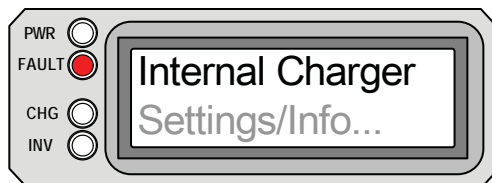
Remedy: Perform an inverter reset; see section 6-2. After resetting the inverter, press the ON/OFF INVERTER button to turn the inverter on and verify the fault has cleared. If the "internal" fault remains, the inverter will require repair at an authorized service facility.



Internal Bridge appears on the LCD and the FAULT (red) LED is on. The PWR (green), CHG (green) and INV (green) LED's are off.

Figure 5-33, Internal Bridge Fault

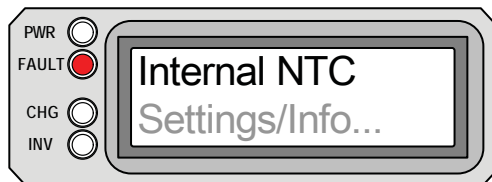
- **Internal Bridge** - This fault message displays and the inverter shuts down because the internal power-bridge protection circuit has been activated.



Internal Charger appears on the LCD and the FAULT (red) LED is on. The PWR (green), CHG (green) and INV (green) LED's are off.

Figure 5-34, Internal Charger Fault

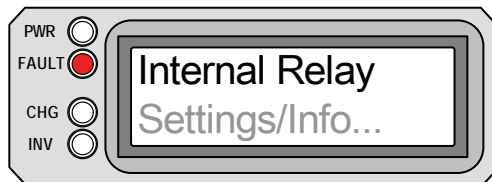
- **Internal Charger** - This fault message displays and the inverter shuts down because the internal charger protection circuit has been activated.



Internal NTC appears on the LCD and the FAULT (red) LED is on. The PWR (green), CHG (green) and INV (green) LED's are off.

Figure 5-35, Internal NTC Fault

- **Internal NTC** - This fault message displays and the inverter shuts down because the internal NTC (temperature sensor) circuit has been activated.



Internal Relay appears on the LCD and the FAULT (red) LED is on. The PWR (green), CHG (green) and INV (green) LED's are off.

Figure 5-36, Internal Relay Fault

- **Internal Relay** - This fault message displays and the inverter shuts down because the internal AC transfer relay protection circuit has been activated.

5.0 Operation

5.3.4 LED Indicator Guide

The remote provides the following LED's; use them along with the LCD display to determine the operating status.

Table 5-1, LED Indicator Guide

LED	Status	Meaning
PWR (green)	OFF	1. Inverter is disabled; 2. Remote's in Power Save mode - press any button to activate LED's; 3. No power to remote (check remote cable or power to inverter); or 4. No AC power at the inverter's AC output terminals.
	ON	AC power is available from inverter, utility or generator at the inverter's AC output terminals.
FAULT (red)	OFF	Normal operation.
	ON	A fault condition has been detected, check the LCD display to find and correct the cause.
CHG (green)	OFF	1. Remote is in Power Save mode - press any button to activate LED's; or, 2. Charger off - no utility or AC generator present.
	ON	Bulk, Absorb, Float or Equalize charge mode (see the LCD display to determine charge status).
	BLINKING, display says "Charger Standby".	The charger is in Charger Standby mode. This occurs when the ON/OFF CHARGER button is pressed to disable the charger.
	BLINKING, display says "Full charge" or "Silent".	The charger is in Battery Saver mode. This mode monitors battery voltage level and only Charges if the battery voltage decreases to a low level. Silent mode will automatically start charging when the ReBulk setting is reached.
	BLINKING, display shows a charging status (i.e., Bulk, Absorb, Float).	The charger current is automatically decreased because: 1. Charger Back-off - the inverter's internal temperature is getting hot, current is decreased to reduce/maintain temperature; or 2. Low AC Input Voltage - the input AC voltage is <85 VAC, charger is disabled to help stabilize incoming AC voltage to prevent AC disconnect.
	BLINKING, display <u>does not</u> show any charge status.	The inverter is detecting AC voltage (from utility or an AC generator) on the inverter's AC input terminals.
INV (green)	OFF	1. Inverter is disabled; or, 2. Remote is in Power Save mode - press any button to activate LED's
	ON	Inverter is enabled - 1. Supplying AC power on the output; or, 2. In standby (if both INV and CHG LED's are on); the inverter will automatically supply AC power to the loads if utility or generator power is lost.
	BLINKING	Inverter is in Search mode (the AC load is below the Setup 02A Search Watts setting).

6.0 Troubleshooting

The remote may not be functioning correctly, use the following table to help find a solutions.

Table 6-1, Remote Control Troubleshooting Guide

Symptom	Possible Cause	Solution
Display shows unrecognizable letters or symbols.	Static electricity may have been discharged into the LCD display	Refresh Display: press and hold the SELECT button for 10 seconds.
LCD text display is locked-up, pushing any button has no response - may show "revision" or "connecting".	RJ11 connections on communication cable are not making a good connection	Reset remote: 1) disconnect remote cable from inverter for 5 seconds and reconnect; 2) check RJ11 cable connection on back of remote (see Figure 2-3). <u>Important:</u> ensure the RJ11 connector is pushed into the correct port; you should feel/ hear "click" when the connection is made.
	Remote not getting sufficient power from inverter.	Ensure inverter batteries are connected and inverter is operating correctly; inverter should be able to Invert and power AC loads from batteries (ensure no AC power is connected to the inverter AC inputs).
LEDs and backlight are off.	Remote is in Power Save mode.	Press any button to reactivate remote (or turn Power Save mode Off).
Remote is non-functional (no lights, no text on LCD display and no response when pressing any button).	Communication cable bad or not correctly connected to remote port on inverter.	Check communications cable from inverter to remote; ensure: 1) it is connected to the REMOTE port, 2) the correct communications cable is used (a 4-conductor telephone cable may be substituted to determine if cable is good).
	Inverter is not connected to batteries.	Ensure inverter batteries are connected and inverter is operating correctly without any AC power connected (can Invert and power AC loads from batteries).

6.0 Troubleshooting

6.1 Troubleshooting Tips

6.1.1 Inverter Problems:

- **Inverter turned on, green LED on inverter blinking, no output:** inverter is in Search mode. Either defeat search mode, if not needed, or turn on loads greater than the Search Watts setting.

6.1.2 Charger Problems:

- **Unit won't transfer to charge mode with AC applied:** Is charge (CHG) LED on remote blinking? If not, then the charger does not recognize the incoming AC being within acceptable limits. Measure the input AC voltage at the inverter input terminals, it should be 120VAC +/- 20 VAC (230VAC +/- 40 VAC for export models); also check that VAC dropout setting on the remote is 80 VAC or less (export models: 160 VAC or less). If the CHG LED is blinking, the transfer relay should be closing within 20 seconds, and begin charging. If the LED is on solid, the relay should be closed, and the charger should begin charging.

- **Transfer relay closes then opens and continues to cycle:** AC voltage is too low, or has transients that drop the AC voltage momentarily. Change the VAC Dropout setting to 60 VAC (120VAC for export models) and check for improvements. If the cycling continues, back off the *Charge Rate* from 100% to 10%.

This cycling may also be caused if the AC output of the inverter is connected to the inverter's AC input, check for proper input and output AC wiring.

- **Charger not charging even though charge LED is on steady and the unit says "Charging":** Full charge rates are not obtained in "Charging" mode, only after this mode changes to "Bulk Charging", "Absorb Charging" or "Float Charging" modes.

- **Charger not charging even though charge LED is on steady and the unit says "Bulk Charging" (or "Absorb Charging"):** Check the DC amps meter, and DC voltmeter on the ME-ARC display, it should be 80% or more of rated charge current if the battery voltage is under 14.0 VDC (28.0 VDC on 24-volt models or 48.0 VDC for 48-volt models). If not, check the 03C Max Charge Rate setting and verify the setting is 80% or greater. Still low charge rate? Check the 03A AC Input Amps setting. If no AC loads are being "passed through" the inverter, the 03A Input Amps setting must be 15 amps (25 amps for 3kW unit) or greater, to receive full charge rate.

- **Charger says "Float Charging" not "Bulk Charging" when the AC is first plugged in:** Check DC voltmeter on the ME-ARC display, if the battery is over 13.0 VDC (26.0 VDC for 24-volt models or 52.0 VDC for 48-volt models) then the battery was already charged and the charger automatically goes to "Float Charging" to keep from overcharging the batteries. Try Restart Bulk from the 02 CHG Control menu.

- **Charge amps are lower than expected, or is 0 amps DC:** Measure input AC voltage and increase if the input voltage is under 90 VAC. The charge rate is reduced to try and keep the input voltage above 90 VAC; also check the 03A Input Amps and 03B Max Charge Rate settings to determine if the current is being limited.

- **Charger output voltage is different than expected:** Check the Battery Temperature Sensor (BTS) temperature. If the BTS is installed, the charge voltage settings will increase if the temperature around the BTS is below 77° F (25° C) and decrease if the temperature around the BTS is higher than 77° F (25° C).

6.2 Performing an Inverter Reset

Press and hold the Power ON/OFF button (see Figure 6-1) for approximately fifteen (15) seconds until the Charging/Inverting Status LED comes on and flashes rapidly. Once the rapid flashing has begun, release the Power ON/OFF button. The Status LED will go off after the button is released.

After the inverter reset is completed, press the ON/OFF button to turn the inverter ON.

Some older inverter models do not allow an inverter reset, if the inverter reset fails, you will need to power-down the inverter using the procedure below. In either case, if an "internal fault" does not clear, the inverter will require repair at an authorized service facility.



Info: The Power ON/OFF button is a small momentary type switch which operates by lightly pressing and releasing.



Info: All adjustable inverter/charger settings in the ME-ARC (except for the Setup 01B Contrast, 01C Backlight and 03 Gen Control - which revert back to default) are saved in non-volatile memory and are preserved until changed - even if an inverter reset is performed or if all power to the remote or inverter is removed.



1. Press and hold the Power ON OFF push-button for 15 seconds

2. Watch the Charging/Inverting Status LED, after approximately 15 seconds it should come on and flash rapidly to indicate the inverter has reset. The Status LED will go off after the pushbutton is released.

Figure 6-1, Performing an Inverter Reset

6.3 Powering Down the Inverter

Perform the following steps to power-down the inverter:

1. Remove all AC power (utility or generator power) to the inverter.
2. Disconnect the positive battery cable to the inverter.
3. Ensure the inverter and remote control are disconnected from all AC and DC power (the remote display will be blank).

After the inverter has been disconnected from all power for 30 seconds, reconnect the positive battery cable and resume operation.



Info: There may be a momentary spark when the positive battery cable is connected to the inverter's terminal; this is normal and indicates that the inverter's internal capacitors are being charged.

7.0 Service and Warranty Info

7.0 Limited Warranty

Magnum Energy, Inc., warrants the ME-ARC remote control to be free from defects in material and workmanship that result in product failure during normal usage, according to the following terms and conditions:

1. The limited warranty for this product extends for a maximum of 24 months from the product's original date of purchase; or for the same period as the connected Magnum Energy inverter if the inverter and remote are newly installed at the same time, up to a maximum of 36 months.
2. The limited warranty extends to the original purchaser of the product and is not assignable or transferable to any subsequent purchaser.
3. During the limited warranty period, Magnum Energy will repair, or replace at Magnum Energy's option, any defective parts, or any parts that will not properly operate for their intended use with factory new or rebuilt replacement items if such repair or replacement is needed because of product malfunction or failure during normal usage. The limited warranty does not cover defects in appearance, cosmetic, decorative or structural parts or any non-operative parts. Magnum Energy's limit of liability under the limited warranty shall be the actual cash value of the product at the time the original purchaser returns the product for repair, determined by the price paid by the original purchaser. Magnum Energy shall not be liable for any other losses or damages.
4. Upon request from Magnum Energy, the original purchaser must prove the product's original date of purchase by a dated bill of sale, itemized receipt.
5. The original purchaser shall return the product prepaid to Magnum Energy in Everett, WA. After the completion of service under this limited warranty, Magnum Energy will return the product prepaid to the original purchaser via a Magnum-selected non-expedited surface freight within the contiguous United States and Canada; this excludes Alaska and Hawaii.
6. If Magnum repairs or replaces a product, its warranty continues for the remaining portion of the original warranty period or 90 days from the date of the return shipment to the original purchaser, whichever is greater. All replaced products and parts removed from repaired products become the property of Magnum Energy.
7. This limited warranty is voided if:
 - the product has been modified without authorization,
 - the serial number has been altered or removed,
 - the product has been damaged through abuse, neglect, accident, high voltage or corrosion.
 - the product was not installed and operated according to the owner's manual.

BEFORE RETURNING ANY UNIT, CONTACT MAGNUM ENERGY FOR A RETURN MATERIAL AUTHORIZATION (RMA) NUMBER.



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