Power Panel Operation Overview

There are two power panels in use at Quad D. There is one in each power room in the small garage and the big garage. Each power panel consists of two each Trace SW4048 inverters, 2 or 4 each Trace C-40 charge controllers, AC input & bypass breakers, DC input breakers, and PV array breakers. There is a display panel and operating buttons on the face of each inverter.

The inverters and charge controllers are to be setup per the Setup Instructions. Most problems can be resolved using the Trouble-Shooting Guide.

During trouble-shooting or after a repair, verify all breakers are in the correct positions:

The AC breakers should have the “OUTPUT” ON and the “BYPASS” OFF. The DC breakers should all be ON, the 175-amp input breakers to the inverters are ON and the 40 amp isolation breakers from the PV arrays are ON.

During normal operation, the following should be observed for each inverter:

“LINE TIE” (yellow), “AC IN GOOD” (green), and “FLOAT” (green) LEDs are lit (if within 2 hours after a power outage the “BULK” LED will be lit instead of “FLOAT”.

Each SW4048 display should be on Menu #4 showing “INVERTER/CHARGER AMPS”. One inverter will normally be reading much higher than the other inverter. The total amps displayed on the inverter will be ~ 40% of the total of the charge controller amps. For example, if each of the 4 charge controllers is showing ~ 25 amps, then one inverter will show ~ 30 amps and the other inverter will show ~ 10 amps.

The C-40 display shows “ARRAY/LOAD CURRENT”, “WATTS”, “BATTERY VOLTAGE”, “RESETTABLE AMP-HOURS”, and “TOTALIZING AMP-HOURS”. The most critical to observe are on the top line. “ARRAY/LOAD CURRENT” will vary with time of day, time of year, and cloud cover, the typical peak reading is ~ 25-30 amps. The “WATTS” will vary for the same reasons; the typical peak reading is ~ 1500-1800 watts. The “BATTERY VOLTAGE” will vary slightly around ~ 53 volts, unless a bulk charge is in operation when the reading is ~ 57 volts. The green LED is normally blinking during charging, although may be solid green if the batteries are fully charged.

Setup Instructions

Inverter Setup (SW4048)

To access the applicable menu, follow these guidelines:
Press the "On/Off Menu" (red) button on the far right, screen shows menu #1.
Press the "Menu Headings" arrow (↑ or ↓) to move to different menu #.
On the menu # of choice, press the "Menu Item" arrow (↑ or ↓) to select a group of menu items.
To choose the correct menu item, e.g., "On", "Sell", press the "Set Points" arrow (↑ or ↓) until the black underscore is under the desired option.

Menu #:
1. Inverter mode: Set inverter "on"
2. Generator mode: Set generator "off".
3. Trace Engineering: N/A
4. Meters: Set to "Inverter/Charger Amps AC" (when finished other settings).
5. Error causes use to find error problems (scroll headings).
6. Time of Day: Set hours/minutes.
7. Generator timer: N/A
8. End User Menu: N/A

Access remaining menu items by depressing red & green buttons simultaneously.

9. Inverter setup: Grid Usage: Sell (remaining items to default)
10. Battery charging:
    - Bulk DC: 57.6
    - Absorption time: 2:00
    - Float DC: 53.2
    - Equalize DC: 57.6
    - Equalize time: 0:00
    - Max charge amps: 5
    - Temp. comp: Lead acid

All other menu items are set to factory defaults.

Charge Controller Setup (C-40)

Set float volts (internal rheostat) to ~ 53 VDC

Set equalize volts (internal rheostat) to ~ 57 VDC (note, not used)

Wind Controller Setup

Set voltage regulator switch to 2.2 VDC (corresponds to 52.8 VDC)

How to Operate: To access the applicable menu (e.g., #5 error causes, #1 inverter operation), follow these guidelines:

1. Press the "On/Off Menu" (red) button on the far right to access menu #1. Press the red and green buttons simultaneously to access menu #9.
2. Press the "Menu Headings" arrow (↑ or ↓) to scroll to different menu #.
3. On the menu # of choice, press the "Menu Item" arrow (↑ or ↓) to select a group of menu items.
4. To choose the correct menu item to change (primarily on menu #1), e.g., "On" (menu 1), "Sell" (menu 9), press the "Set Points" arrow (↑ or ↓) until the black underscore is under the desired option.

Primary Trouble-shooting Steps:

1. Go to Menu #5 (Error Causes) by pressing the "On/Off Menu" (red) button on the far right, screen shows menu #1 (Inverter Mode); then press the "Menu Headings" arrow (↑ or ↓) to scroll to menu #5. Usually the "Error" (red LED) will be blinking, even if not, check for the error reason in menu #5 by pressing the Menu Item arrow (↑ or ↓) to view each error cause. You will see a "No" or "Yes" by each item when scrolling. Record the error cause, then go to step 2.
2. Go to Menu # 1 (Inverter Mode) by pressing the "On/Off Menu" (red) button on the far right. Reset by turning off the inverter by pressing the Set Points arrow (↑ or ↓) until the black underscore is under the "Off". Wait for ~ 1 minute, then turn inverter back on by pressing the Set Points arrow (↑ or ↓) until the black underscore is under the "On". The "Line Tie", "AC1 In Good", and "Bulk" or "Float" LEDs should now be lit (may have to wait a few minutes for operation to stabilize, i.e., all LEDs lit). Go to Menu # 9 (Inverter Settings) to put in "Sell" mode, if "Line Tie" does not operate.
3. Go to Menu #4 (Meters) by pressing the "On/Off Menu" (red) button on the far right, screen shows menu #1; then press the "Menu Headings" arrow (↑ or ↓) to scroll to menu #4. Press the "Menu Item" arrow (↑ or ↓) to select "Inverter/Charger Amps AC", which is the normal display.

Secondary Trouble-shooting Steps:

1. If the inverter will not synchronize with the grid, e.g., oscillates between “invert” and “float” check the push-button AC input breaker (bottom on the end with the external stacker cables and AC lines, left side when facing the inverter). If out, turn the inverter off (menu #1), push in to reset, then turn inverter on (menu #1).
2. If the inverter will not stay on because of “high battery voltage”, turn off the breakers that isolate the PV arrays, the breakers are on the side of the battery disconnect box (with no load the open circuit voltage from the PV modules exceeds the high battery voltage limit). Turn inverter on (menu #1), allow to sync, and then turn the PV breakers on.
3. If the inverter will not stay on because of “over current”, turn off the load breakers in the back up breaker box. Turn back on once the inverter stays on.
4. If the inverter continues to show error messages, e.g., “external stacking” (Trace term for anything not identified elsewhere), then turn off the battery breakers and the PV breakers, wait at least 5 minutes, then turn the breakers back on. The programming will have to be re-entered (menu #’s 9 & 10 in Setup Instructions) before turning the inverter on.

Trouble Shooting Guide – Charge Controller (C-40)

A. For problems with the display, e.g., partial display (typically, no amps and watts, but resettable amp-hours, cumulative amp-hours, and volts are still visible):

A. Hold the reset button (on the right side of the C-40) until the LED starts to blink, then release. This will take 15-30 seconds. The LED will blink red and green.

B. If the amps and watts readings are present, noting will need to observe for ~ 30 seconds to verify, push the reset button until the LED goes dark (~ 10 seconds). Release immediately, the LED should be blinking green if the batteries are being charged. If the reset button is not released quick enough, the LED will continue to blink red or red/green, just hold the reset button in again until the LED goes briefly dark, then release.

B. If this does not work, try the following steps:

1. Turn off the breaker to the associated PV array (on the side of the power panel DC breaker box).
2. Hold the reset button (on the right side of the C-40) until the LED starts to blink red, then release. This will take 15-30 seconds. The LED may also blink red and green.
3. Turn the breaker back on to verify reading amps and watts for the PV array.
4. If the readings are present, noting will need to observe for ~ 30 seconds to verify, push the reset button until the LED goes dark (~ 10 seconds). Release immediately, the LED should then be either solid green if the batteries are fully charged or blinking green if the batteries are being charged. If the reset button is not released quick enough, the LED will continue to blink red or red/green, just hold the reset button in again until the LED goes briefly dark, then release.
5. If the readings are not present, repeat steps 2 to 4. Waiting a few minutes after turning off the breaker before pushing the reset button may help.

If this does not fix, then remove front panel and disconnect (phone) cable from display to controller for ~ 2 minutes, then reconnect.

C. If these solutions do not fix, e.g., C-40 locks-up and displays battery volts, but no other readings:

1. Turn off breakers to battery and wait overnight (no PV input). Turn on breakers the next day, then reset as described in section A. If this does not work, then:
2. Remove front cover and disconnect (phone) cable.
3. Disconnect positive lead from PV modules; disconnect positive lead from battery (red cables on left side of box). Make sure leads do not contact any other component, wire, surface, etc.
4. Wait a minimum of 5 minutes (better to wait 10 minutes), then reconnect battery cable, and then reconnect solar panel cable.
5. Put wire nuts on the ends of the cable while waiting to prevent any arcing. Reconnect cable and re-install front cover. Note, can also open PV array breakers, then battery breakers, but will have to re-program inverters. The critical sequence in that the battery power to the controller is first on and last off.