

MAX HYBRID 15 KW INVERTER

Setup Guide



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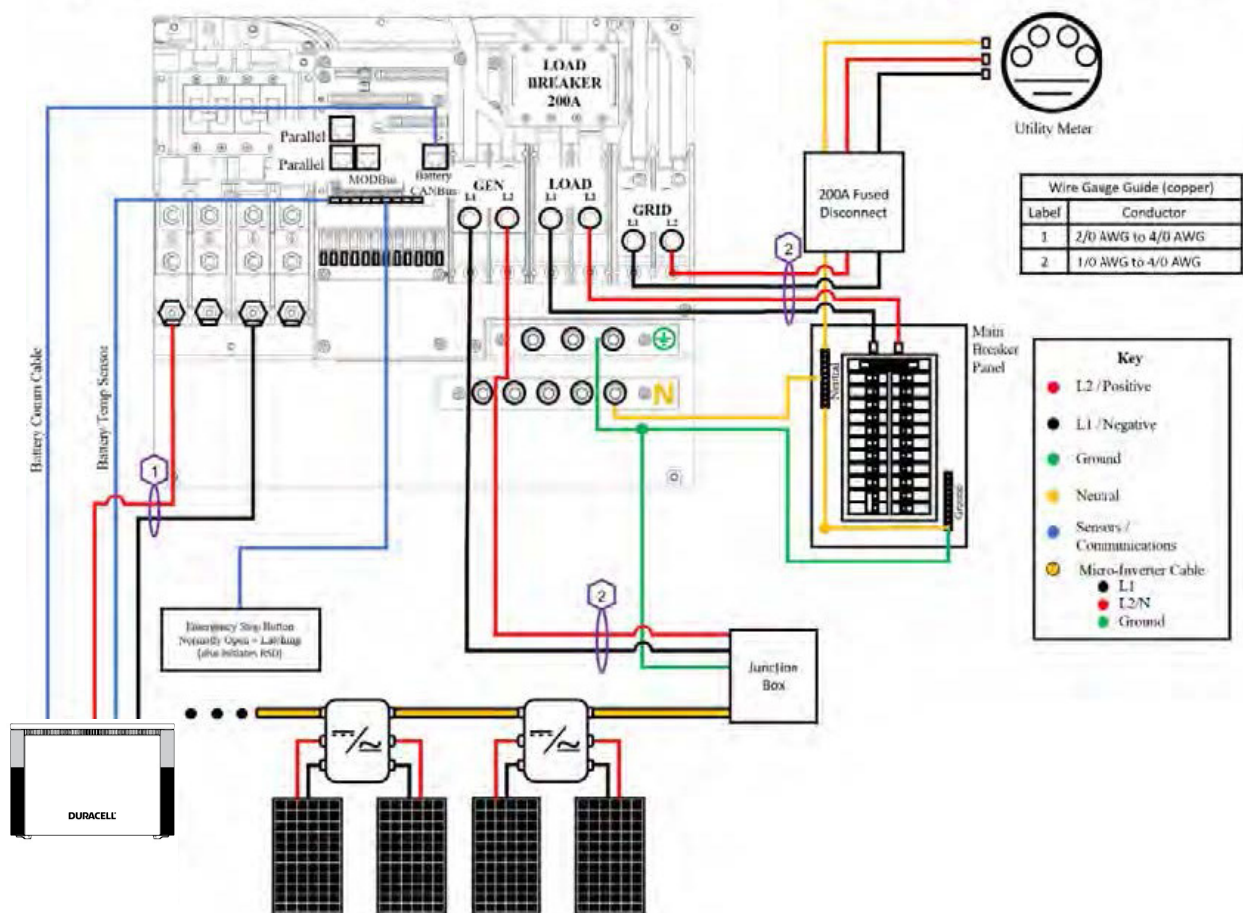
Quick Start Guide

How to turn on the system safely and effectively.

Max Hybrid 15 AC Coupling with Micro Inverters Wire Diagram 120V/240V

Note: This Wiring Diagram is an example of common use-cases for Duracell Power Center Inverters

If you have any questions, please email support@duracellpowercenter.us or call 1-800-955-0193.



This guide outlines the quick start process for wiring and activating the Duracell Power Center Max Hybrid 15 kW inverter.

1. Pre-Commissioning Checks

- Ensure safety procedures are understood and PPE is available.
- Confirm you have all tools and equipment necessary for installation.

2. Battery Mode Options and AC Coupling Guide

- Refer to the **Battery Mode Examples (page 11)** to understand the inverter's operational modes and select the mode according to your system requirements.
- Review the **AC Coupling Guide (page 5 of AC Coupling Guide)** for setting up micro inverters into the Gen (generator) port.

3. Initial Setup and Checks

- PV Input Circuit Check
 - Verify each PV input circuit voltage does not exceed 500 Voc Temp. corrected.
 - Ensure no PV+ or PV- is connected to GND and check polarity.
- Grid Input Voltage Check
 - Measure voltage between L1 to Neutral and L2 to Neutral to ensure 120 Vac and 240 Vac, respectively.
 - Confirm Neutral and Ground are approximately 0 Vac.
- Battery Voltage Check
 - Ensure voltage is of 45 Vdc – 60 Vdc.
 - Turn on battery switch and built-in battery disconnect.
 - Activate batteries using the switch, then press and hold the primary battery button for 3 seconds to turn on the other batteries.
 - Turn on Built-in battery disconnect(s) inside the inverter on the left side labeled BATTERY.

4. Powering-Up Procedure

- Ensure connection of Max Hybrid 15 to batteries, panels, and grid.
- Activate grid power by turning on the LOAD disconnect.
- Press unit's power button on the left side.
- Verify solar panel inputs are not grounded, then engage the DC disconnect switch (if DC coupled into the inverters MPPT ports).

5. Monitor Indicator LEDs

- Green for DC Solar Panels' activity and Green for AC indicating Grid or Generator connection.

6. System Settings

- Now that the system is powered on and the normal light is green, we can adjust the batteries capacity, charge, and discharge rates. Please proceed to the next section, Commissioning, to verify these values.

7. Amperage and Cable Connection Table

- Refer to the Dura5 Manual table below to determine system handling capacity based on the number of batteries and inverter connections. Ensuring the correct amperage in the system is crucial to prevent inefficiency or damage.

Battery Configuration and Amperage Table

Battery	KIT W	KIT G	1 set of cable	2 sets of cable	3 sets of cable	4 sets of cable
1	✓	✓	80A/4KW			
2	✓	✓	100A/5KW	160A/8KW		
3	✓	✓	100A/5KW	160A/8KW	240A/12KW	
4	—	✓	100A/5KW	200A/10KW	300A/15KW	320A/16KW

Additional Notes:

- For a single set of cables, the system supports a maximum amperage of 100A; with two sets, it can handle up to 200A.
- Match inverter settings to the number of cables and batteries used for appropriate charge/discharge rates. Ensure settings align with the maximum power output of the battery/cable configuration to prevent inefficiency or damage.
- Always consult the inverter's manual to accurately match settings with your specific battery and cable setup. Adjust inverter settings to optimize system performance and safety.

8. Final Verification

- Ensure settings align with the **Battery Configuration and Amperage Table**.
- Confirm amperage settings match your system configuration using the table.
- Please verify that all connections are firmly secured and ensure there are no instances of reversed polarities.

9. Commissioning

- Once all checks are completed and settings confirmed, the system is ready for use.

Note: Always refer to the manufacturer's manual for detailed instructions and safety information. The steps provided here are for quick reference and should be used in conjunction with the manual.

Commissioning

After turning on your system, follow these steps to configure battery settings for optimal performance.

Battery Setup

1. Access Battery Setup:

Click on the gear icon in the upper right-hand corner of the system interface to navigate to the 'Battery Setup' section.

2. Battery Capacity:

Enter your battery storage total capacity in amp-hours (Ah). Example: "400Ah".
Note one Dura5 battery = 100Ah, total capacity = (battery quantity x 100)

3. Maximum Charge/Discharge Current:

- Set 'Max A Charge' to your batteries' maximum charging amperage.
Example: "200A."
- Set 'Max A Discharge' to your batteries' maximum discharging amperage.
Example: "200A."

Battery Configuration and Amperage Table

Battery	KIT W	KIT G	1 set of cable	2 sets of cable	3 sets of cable	4 sets of cable
1	✓	✓	80A/4KW			
2	✓	✓	100A/5KW	160A/8KW		
3	✓	✓	100A/5KW	160A/8KW	240A/12KW	
4	—	✓	100A/5KW	200A/10KW	300A/15KW	320A/16KW

System Amperage Handling:

- For a single set of 4 AWG cables, the system supports a maximum amperage of 100A; with two sets of 4 AWG, it can handle up to 200A.
- Match inverter settings with the number of cables and batteries for proper charge/discharge rates. Ensure settings align with the battery/cable configuration's maximum power output to prevent inefficiency, damage, or potential danger.

- Consult the inverter's manual to accurately match settings with your specific battery and cable arrangement. Adjust settings for optimized performance and system safety.
- Check 'Activate Battery' when ready to bring the battery online after completing settings.

4. **Check BMS Lithium Batt:** Ensure this value is set to 00.

5. **Check Use Batt V:** This serves as the default for battery communications should BMS communications fail.

6. **Activate Battery:** After confirming the above settings, activate the battery to bring it online and proceed to the charge tab settings.

Charge Tab Settings:

1. Set the 'StartV' for the voltage at which charging should initiate. Example: "49.0V".
2. Set the 'Start%' for the state of charge percentage at which charging should start. Example: "30%".
3. Float V = 55.7 V
4. Absorption V = 56.0 V
5. Equalization V = 56.0 V

Discharge Settings:

1. Shutdown 46.0 V / 10%
2. Low Batt 47.5 V/ 10%
3. Restart 52.0 V/ 11%

Smart Load Management:

- For AC-coupled micro inverters into the Gen port, refer to the AC Coupling Guide.

Saving Settings:

- After configuring all parameters, click 'OK' to save settings.
- To exit without saving, click 'CANCEL'.

Internet Connection Guide

Connect the system to the internet using the dongle.

1. Connect to the Dongle Network

- Navigate to your device's (smartphone/tablet) Wi-Fi settings.
- Select the network with the name EAP-##### (##### = the last 5 digits of your SN number).
- Enter the password provided (e.g., 12345678).
- **Note:** The Wi-Fi dongle does not have internet access. It's for connecting to the inverter's dongle only.

2. Log in to Web Portal

- Open a web browser and go to 10.10.10.1.
- Scroll down to "Wi-Fi Connection" and press "Scan" to search local networks.
- Select your HOME Network (do not select the dongle network).
- Enter your personal Wi-Fi password and select "Connect".

3. Save Your Information

- After connecting, ensure you save your configuration.
- If successful, you should see a red and green light on the dongle indicating a successful connection.
- **LED Indicators:**
 - Red LED: Power is on.
 - Green LED: Connected to the internet and server.
 - Flashing Green LED: Connected to the router but not the server (check VPN/firewall settings).

4. Disclaimer

- Connecting the dongle via the IP address only connects the dongle to the internet.
- You must still create an account via the Power Center App to manage the inverter settings.

Battery Preferences

Customize the battery's charge and discharge settings based on time-of-use preferences to ensure optimal battery performance and maximum energy cost savings.

Setting Up Time-of-Use Parameters:

1. Access the Limiter Tab:

- Navigate to the 'Limiter' section of the inverter's menu.

2. Enable Limited Power to Load

- Activate Limited Power to Load.

3. Enable Time-of-Use:

- Select 'Time of Use' to schedule charge and discharge.
- By default, system discharges mornings/nights and charges during the day.

4. Custom Scheduling:

- Use the table to set specific times for charging or discharging.
- 'Time' column: Enter desired action times.
- 'Power(W)' column: Set power limit.
- 'Batt Charge' column: Define battery charge level.
 - Under 100%: Discharge to level.
 - 100%: Charge to full capacity.

5. Charge:

- When charge is selected the time slot is dedicated to charging up to a battery charge level from the grid (when on-grid) or a generator (when off-grid).

6. Sell:

- When 'Sell' is selected, the time slot is dedicated to discharging the battery at the maximum Power (W) set, regardless of loads. This can result in a sell back to the grid from the battery.

7. Programming the Schedule:

- Example: To discharge at 5 AM to 50%, enter '05:00 AM' in 'Time' and '50%' in 'Batt Charge'.
- To charge to 100% at 9 AM, enter '09:00 AM' and '100%'.

8. Finalizing Settings:

- Check 'Charge' or 'Sell' boxes to activate settings.
- Review settings to confirm alignment with your schedule.

9. Save and Exit:

- Click 'OK' to save.
- To cancel without saving, click 'CANCEL'.

Optimization Tips:

- Discharge during peak hours to cut costs.
- Charge during low-cost hours if grid rates vary.
- Ensure settings comply with local grid policies.

Battery Mode Examples

Understand the inverter's flexibility and capabilities to better tailor the system for maximum efficiency and cost savings.

Time-of-Use (TOU) Tariffs

- **Description:** TOU tariffs adjust electricity rates based on time of day. Rates are typically higher during peak high-demand hours and dropping off during off-peak hours.
- **Use When:** Your provider offers variable rates, and you can adapt energy use accordingly.
- **Ideal For:** Suitable for homes or businesses able to shift energy-intensive activities to off-peak hours.
- **Benefits:** Prioritize off-peak energy use to significantly cut electricity bills.
- **Peak Rates Settings Table:**

Time	Power (W)	Batt Charge	Charge	Sell
01:00	8000	50%	<input type="checkbox"/>	<input type="checkbox"/>
05:00	8000	50%	<input type="checkbox"/>	<input type="checkbox"/>
06:00	8000	50%	<input type="checkbox"/>	<input type="checkbox"/>
09:00	8000	50%	<input type="checkbox"/>	<input type="checkbox"/>
13:00	8000	100%	<input type="checkbox"/>	<input type="checkbox"/>
18:00	8000	50%	<input type="checkbox"/>	<input type="checkbox"/>
22:00	8000	50%	<input type="checkbox"/>	<input type="checkbox"/>

Self-Consumption (Time of Use Default Profile):

- **Description:** Utilize solar energy directly instead of feeding it back into the grid.
- **Use When:** Your solar system generates more electricity than needed, especially during daylight hours.
- **Ideal For:** Suitable for areas with high solar production and minimal grid reliance, or where feed-in tariffs are low.
- **Benefits:** Maximizes solar energy use, reduces grid dependence, and offers predictable energy costs.

- **Default Profile:** The default setting efficiently manages energy by discharging during high-rate hours from 6 PM to 9 AM and charging when rates are lower or when excess solar is available, ensuring efficiency and cost savings without manual adjustments.

Time	Power (W)	Batt Charge	Charge	Sell
01:00	8000	50%	<input type="checkbox"/>	<input type="checkbox"/>
05:00	8000	50%	<input type="checkbox"/>	<input type="checkbox"/>
06:00	8000	50%	<input type="checkbox"/>	<input type="checkbox"/>
09:00	8000	50%	<input type="checkbox"/>	<input type="checkbox"/>
13:00	8000	100%	<input type="checkbox"/>	<input type="checkbox"/>
18:00	8000	50%	<input type="checkbox"/>	<input type="checkbox"/>
22:00	8000	50%	<input type="checkbox"/>	<input type="checkbox"/>

This table can be interpreted as follows:

- At 01:00, the battery will charge down to 50% at 8000W power if the loads are greater than the solar generation. This condition will continue until 13:00.
- At 13:00, the battery will start charging from solar generation until 18:00. Ideally the batteries will start at around 100% and then will start to discharge down to 50% if needed by 18:00.

Backup Power: Enabled when Time of Use is disabled

- **Description:** Backup power mode reserves energy exclusively for use during power outages. Batteries will be reserved at 100%. For a lower reserve, use the Self Consumption setting.
- **Use When:** Frequent or prolonged power outages are experienced.
- **Ideal For:** Suitable for areas with unstable grid infrastructure or prone to natural disasters.
- **Benefits:** Ensures continuous power supply during outages, providing security and peace of mind.

- **Full Backup Mode Settings:** The system will, by default, charge to 100% and use the batteries for backup mode only. If you want to use the batteries exclusively for backup mode, the timetable does not need to be utilized. (Note that enabling Time of Use allows you to set specific times for charging and discharging; having it unchecked will gray out and set the system to full backup.)

Conclusion:

- Selecting solar battery settings depends on individual energy needs, local grid policies, and energy rates. Assess your situation and understand these settings for an informed decision on optimal energy use and savings.

Energy Arbitrage Settings:

- **Description:** Energy Arbitrage involves strategic charging and discharging based on electricity pricing fluctuations, capitalizing on lower energy costs during off-peak hours and reducing reliance on the grid during peak hours to manage energy costs effectively.
- **Use When:** Ideal for areas with variable electricity rates, higher during peak hours and lower during off-peak hours.
- **Ideal For:** Particularly beneficial for households or businesses in regions with significant differences in energy prices throughout the day, allowing for cost-effective energy management.
- **Benefits:** Energy Arbitrage settings can lead to substantial cost savings by reducing energy purchases during expensive peak hours. It also enhances the efficiency of solar energy utilization and reduces the environmental impact by optimizing battery usage.
- **Settings Chart:** Specifies actions at different times.

Time	Power (W)	Batt Charge	Charge (<input checked="" type="checkbox"/> / <input type="checkbox"/>)	Sell (<input checked="" type="checkbox"/> / <input type="checkbox"/>)
01:00	8000	50%	<input checked="" type="checkbox"/>	<input type="checkbox"/>
05:00	8000	50%	<input checked="" type="checkbox"/>	<input type="checkbox"/>
06:00	8000	50%	<input type="checkbox"/>	<input type="checkbox"/>
09:00	8000	50%	<input type="checkbox"/>	<input type="checkbox"/>
13:00	8000	100%	<input type="checkbox"/>	<input type="checkbox"/>
18:00	8000	50%	<input checked="" type="checkbox"/>	<input type="checkbox"/>
22:00	8000	50%	<input checked="" type="checkbox"/>	<input type="checkbox"/>

In this chart:

- "Charge" (/) signals whether the battery will charge () or not () during that time.
- "Sell" (/) indicates if excess energy is sold to the grid () or not ().
- "Battery Charge" displays the targeted battery level for that specific time.
- "Power (W)" represents the consistent power setting at 8000 Watts. (This setting is determined by the max amperage settings, 200 amps = 12000 watts, 100 amps = 5,500 watts) This is 56 Vdc (DC battery voltage) x amperage of batteries located in **Battery Configuration and Amperage Table**.) 80 amps = 4,500 Watts, 100 amps = 5,600 watts, 160 amps = 9000 watts, 200 amps = 11200 watts.
- This chart outlines a strategic approach for your solar battery system, managing energy costs by charging during low-cost grid hours and discharging during high-cost hours at home.

Conclusion:

- Energy Arbitrage settings are a smart way to manage energy costs effectively. By understanding and implementing these settings based on your local utility's rate structure and your energy usage patterns, you can maximize the benefits of your solar battery system, resulting in optimized energy use and significant cost savings over time.

Max Hybrid 15 kW Limited Warranty

Duracell Power Center stands behind its products with a 10-year Limited Warranty, starting from the purchase or receipt date, whichever is later. This warranty is transferable if the product remains in its original location, and notification to Duracell Power Center is required when selling your home.

However, the warranty excludes damage resulting from: installation errors, alterations or disassembly, normal wear and tear, accidents or abuse, unauthorized firmware/software updates, corrosion, lightning, repair or service provided by an unauthorized repair facility, operation or installation contrary to manufacturer product instructions, acts of nature, shipping or transportation, incidental or consequential damage caused by other components of the power system, any product whose serial number has been altered, defaced, or removed, or any other event not foreseeable by Duracell Power Center.

Duracell Power Center's liability for a defective product is limited to repair or replacement, at its discretion. It's important to note that the warranty does not cover installation, removal, shipping, or reinstallation costs. For LCD screens and fans, the warranty is valid for five years from the purchase date.

Duracell Power Center emphasizes that it disclaims all other warranties and limits its liability strictly to repair or replacement. The company explicitly does not cover incidental or consequential damages. In the case of returns, prior authorization and a Return Material Authorization (RMA) number are required. The returned product must be in brand new condition, packaged in the original manufacturer's carton, and shipped with prepaid freight and insurance. Returns are subject to a 35% restocking fee, and no returns are accepted beyond 30 days from the original delivery date. Any missing items will be deducted from the refund.

To secure full warranty coverage, the Max Hybrid 15 Install Operational Verification Checklist Questionnaire must be completed, signed, and dated. For any inquiries about the return policy, you can reach out to Duracell Power Center at support@duracellpowercenter.com or 1-800-955-0193 during regular business hours (Monday to Friday).