# USER MANUAL

## 48V 100Ah / 100A $LiFePO_4$ BLUEDGE BATTERY

AT-LFP-48-100-BTC-AV10


**We may modify these specifications without prior notice.*

## Specifications

| AT-LFP-48-100-BTC-AV10 | | |
|---|---|---|
| **Physical** | Size | 520 L x 267 W x 229 H (mm) |
| | Weight | 40.5kg |
| | Connection terminals | M8 |
| | Connection terminals torque rating | 6Nm |
| | Casing material | ABS |
| | IP Rating | IP66 |
| | Chemistry | Lithium iron phosphate ($LiFePO_4$) |
| | Cell type | Prismatic |
| **Electrical** | Rated capacity | 100Ah / 5120WH (at 0.2C) |
| | Battery packs in series | Not supported |
| | Battery packs in parallel | Supported |
| | Battery cycle life | 6000 times (0.2C standard charge and discharge) |
| | Rated voltage / nominal voltage | 51.2V |
| | Operating voltage range | 40V - 58.4V |
| | Shipping voltage | 49 - 57V |
| | Recommended charge voltage | 57.6V |
| | Max charge voltage | 58.4V (3.65V per cell) |
| | Cut-off voltage | 40V / When lowest cell reaches 2.5V |
| | Depth of discharge (DoD) | 100%, Recommended DoD 80% |
| | Standard charge current (Recommended) | 20A |
| | Charging time (At recommended charge current) | 4-5 Hours |

## Specifications Cont.

| | | |
|---|---|---|
| **Electrical Cont.** | Maximum charge current | 100A |
| | Max continuous discharge current | 100A |
| | Peak discharge current (3 seconds) | 200A |
| | Internal resistance | ≤ 20mΩ |
| **Environmental** | Operating power consumption | ≤25mA |
| | Operating temperature | Charge: 0°C~ 55°C (Ambient)<br>Discharge: -20°C~ 60°C (Ambient) |
| | Storage temperature range | Within 2 months: -20°C~ 40°C<br>Within 6 months: -10°C~ 35°C |
| | Recommended storage temperature | 20°C±5°C |
| | Storage humidity | 10% - 90% |
| | Recommended storage duration | Charge to 53.2V<br>OR 40 - 60% SOC every 6 months |
| **Circuit Protection** | Cell over charge protection | 3.65V±0.05V |
| | Cell over-discharge protection | 2.5V±0.1V |
| | Charging over current protection | 105A (8s) |
| | Discharging over current protection | 1st 180A (3.5s)<br>2nd 200A (2s) |
| | Short circuit protection | 500A (400us) |
| | High temp. discharge / charge protection | 60°C±5°C |
| | Low temp. discharge / charge protection | -10±5°C |

## Thank you

Dear valued customer,

Thank you for choosing Amptron Batteries. We greatly appreciate your support. Our team works behind the scenes to create advanced battery systems, while providing top-notch Australian based service to our customers.

Support and feedback from our customers, along with the dedication of our staff, allows us to deliver exceptional products, competitive prices, and an overall excellent experience.

Thanks again for giving us your vote of confidence. We hope that you'll enjoy using our products as much as we've enjoyed creating them.

Please feel free to reach out to us anytime.

*Sincerely*,
**Amptron**

## Product Registration

We offer warranty coverage for all of our battery systems.

To register your product, visit https://amptron.au/product-registration and include your proof of purchase to simplify any future warranty claim.

Please fill out the below information for your own record keeping:

Battery Model: .....

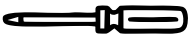
Serial Number: .....

Purchase Date: .....

Vendor: .....

The latest warranty statement and additional warranty information can be found on our website by visiting: https://amptron.au/warranties

## Warnings & Tools Icon Chart

| ICONS | NAME | DESCRIPTION |
|---|---|---|
|  | High voltage | High voltage device. Installation should be performed by an electrician. |
|  | High temperature | This device will produce heat. Mount device away from other items. |
|  | Environmental hazard | Electronic Equipment. Do not put in landfill. |
|  | Wire cutter | A wire cutter is needed for cutting and stripping wires prior to connection. |
|  | Multimeter | A multimeter is needed for testing equipment and verifying polarity of cables. |
|  | Anti-static glove | Anti-static gloves are recommended to prevent controller damage caused by static electricity. |
|  | Electrical tape | Electrical tape is recommended to safely insulate spliced or bare wires. |
|  | Screwdriver | A common size screwdriver is needed to attach wires to the controller. |
|  | Torque wrench | A torque wrench is recommended to secure cables to M8 terminals. |

## Wire Sizing Recommendations

Please see our recommendations for cable sizing below.

**WARNING**! Incorrectly sizing your cables can result in damaged equipment and fire hazards. For more information, please see AS/NZS 3008.1:2017, or consult with an expert.

| DC WIRE SIZING | 40A | 60A | 80A | 100A | 120A | 140A+ |
|---|---|---|---|---|---|---|
| Wire cross section area (mm) | 10 | 16 | 25 | 25 | 35 | 50 |
| Wire AWG | 8 | 6 | 4 | 4 | 2 | 1 |

*The above recommendation is based on cable lengths of 0-1.8m. If cable is longer than this, go to next AWG size for every 1.8m of added length.*

## Warnings!

**Review this manual thoroughly before attempting installation. Failure to follow these safety guidelines can result in property damage, personal injury, or worse.**

- If damaged upon arrival, please contact vendor for product support.
- Beware of any nearby electrical equipment that may interfere with installing this device.
- If using solar panels to charge the battery, ensure they are isolated, or covered, before connecting to the battery.
- If connecting to a DC/DC charger to charge the battery, ensure that the charger is disconnected or isolated from the house / starter battery prior to connecting it.
- **Do not** expose to heat, high voltage and direct sunlight.
- **Do not** short circuit the positive and negative terminals.
- **Do not** store battery along with metal and other conductive materials.
- **Do not** disassemble the battery.
- **Do not** knock, throw or impact the battery.
- **Do not** throw the battery into water.
- **Do not** install in under bonnet applications.
- **Do not** install in an engine starting application.

## Charging Specific Advice

- In order to maximise safety, it is recommended to not charge when the site is unattended.
- When charging, keep the battery in a well-ventilated, dry, free of inflammable and explosive materials, and out of reach of children.
- Always use a battery charger with a lithium profile that does not exceed the charging specifications of the battery (see page 3).
- If you are unsure about which charger to use, please contact Amptron and consider our charger range designed for the batteries.
- Charger must not have an equalisation setting enabled. If this can be disabled then it needs to be turned off.
- When the battery leaves the factory, there is only around 30% capacity in the battery due to freight regulations, please charge the battery before use.

## Discharge Specific Advice

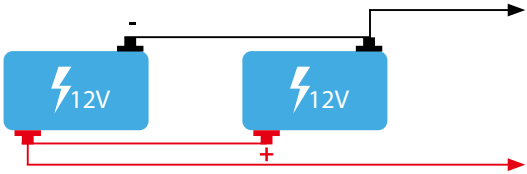
- If battery cuts out on low voltage, disconnect load and charge battery before reconnecting the load. Depending on charger brand and model, you may need to apply secondary source of 12V-14.6V to the terminals to reset the BMS.
- A low voltage cut off device is strongly recommended if your inverter / loads do not have a low voltage cut off. Set to the voltage as shown on page 2 of this manual.
- If the battery goes below the over-discharge protection voltage (as indicated on page 3) or the over-discharge protection is activated, charge battery within 15 days.

## Storage Advice

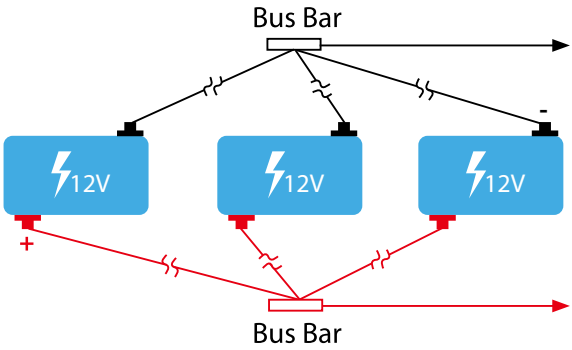
- Battery should be charged every 6 months.
- Ideally, prior to storage, charge the battery to 70% SOC.
- Ideal storage temperature is 20ºC - 35ºC.
- Do not leave battery in low state of charge for long periods of time.
- If battery shows signs of deformation, heat or emits smell, immediately discontinue use.

## Parallel Battery Connection

### 2 Batteries




### 3 Or More Batteries



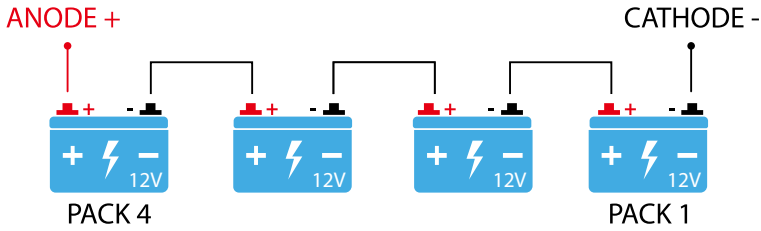

**NOTE:**
*ALL wires* ***MUST*** *be of equal length between all connections to ensure equal resistance.*

For detailed instructions on connecting multiple batteries in parallel, please see our white-paper on the topic via the support section of our website.

1. Ensure all batteries to be in the parallel configuration have been fully charged individually by the same charger.
2. Ensure OCV of each battery is within <0.2V of each other.
3. After charging, set aside and allow to rest for 2-3 hours.
4. Utilising wires of circumference large enough to carry required current, connect the batteries in the above configuration.
5. Ensure all connecting cables are of the same length.
6. Be careful not to reverse connect the positive and negative.
7. Ensure correct charge voltage and current is utilised for configuration.
8. It is prohibited to series a paralleled configuration.
9. Once in parallel configuration, ensure a full charge is completed a minimum of every 3 months.
10. Once in parallel, the 'system' must be charged and discharged as if it were a single battery.

## Series Battery Connection

### Maximum 4 Batteries




For detailed instructions on connecting multiple batteries in series, please see our white-paper on the topic via the support section of our website.

**1.** Up to four batteries can be connected in series for higher voltage applications. Alternatively select a higher voltage battery which Amptron has available.

**2.** Ensure all batteries in the series configuration have been fully charged individually by matched chargers.

**3.** Ensure OCV of each battery is less than <0.2V of each other.

**4.** After charging, set aside and allow to rest for 2-3 hours.

**5.** Utilising wires of circumference large enough to carry required current, connect the batteries in the above configuration. Ensure all connecting cables are of the same length.

**6.** Be careful not to reverse connect the positive and negative.

**7.** Ensure correct charge voltage and current is utilised for configuration:
   a) Two batteries in series: 28.4V to 29.2V, recommended 28.6V
   b) Three batteries in series: 42.6V to 43.8V, recommended 42.9V
   c) Four batteries in series: 56.8V to 58.4V, recommended 57.2V

**8.** Once in series configuration, ensure a full charge is completed a minimum of every 3 months.

**9.** Once in series configuration, the 'system' must be charged and discharged as if it were a single battery.

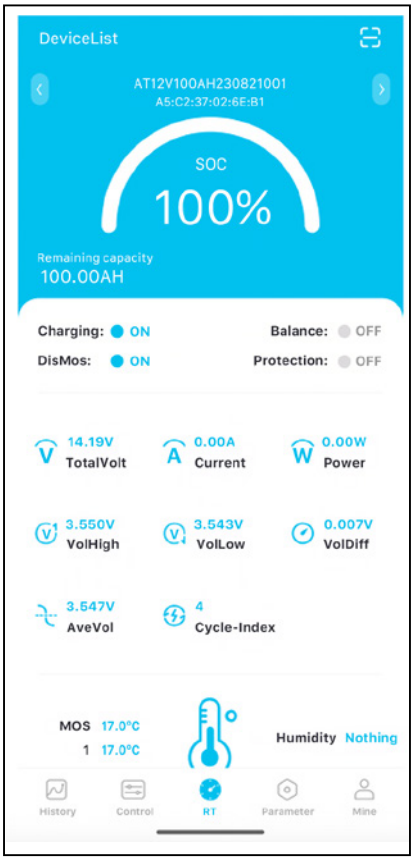
**10.** Consider additional balancers to maintain the individual voltage levels of the batteries. Please get in touch with us for recommended options.

## Bluetooth Smartphone Application

### Key Features

Available as an ad-free download via App Store & PlayStore, currently this is a third party App whilst Amptron develops its own cross-platform app.

The app offers convenient access to battery system data, including:




*This app may look different based on your phone and/or app version.*

- Cycle count
- Current (amperage)
- State of health (SoH)
- State of charge (SoC)
- Temperatures (for each temperature sensor)
- Voltage (minimum, maximum, and average)
- Capacity (design capacity & actual capacity)
- Alerts for safety features and protections

## App Download Instructions

### Instructions

**1.** Install the application using the above QR code links.

**2.** Open the app and ensure permissions are granted if asked.

**3.** Under the list of devices, click on the device with ID starting with AT.

**4.** Your phone once successfully connected to the device, will show the information.

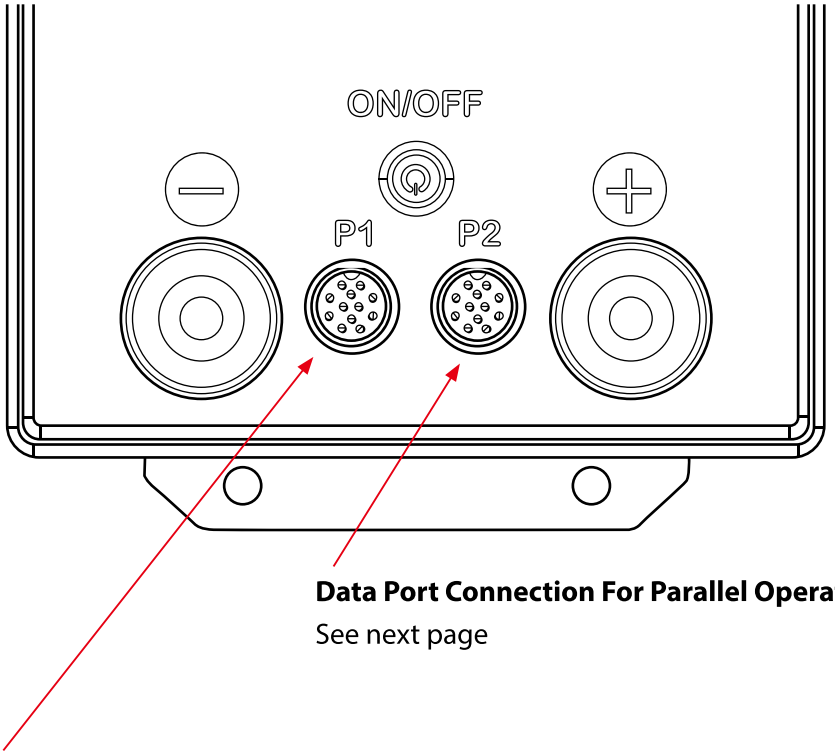
GOOGLE PLAY

APPLE STORE

## Communication Port Instructions

**1.** Along with Bluetooth, your battery is fitted with communication ports which can be used for communication with a compatible inverter or smart device.

**2.** If your installation needs to be compliant with AS/NZS 3001.2.2022, then contact Amptron for advice on meeting the monitoring requirements. An optional monitor can be connected using the P1 interface port on the battery.




**Data Port Connection For Parallel Operation**

See next page

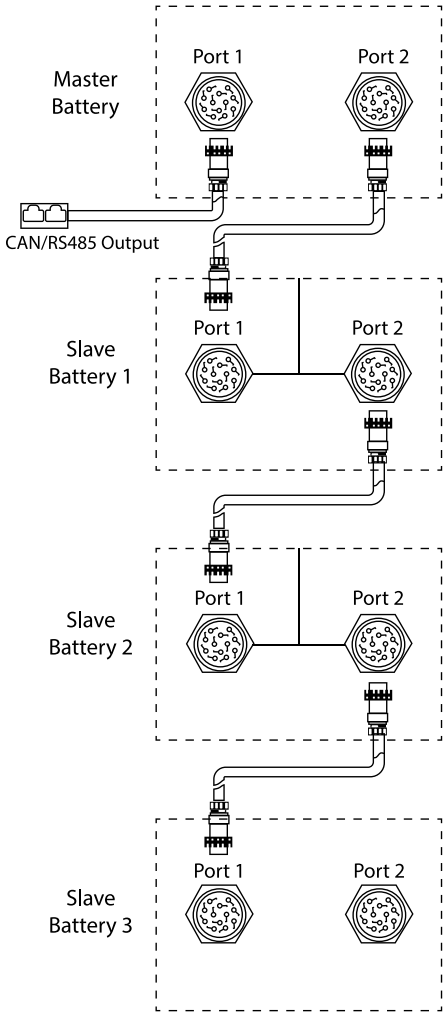
**Data Port Connection For RS485 (PC or optional monitor) / CANBUS.**

Please contact Amptron support for pin out diagram, communication protocols and cable options.

## Parallel Communication Instructions

**1.** Batteries connected in parallel are also able to communicate with an inverter or smart device, via the connection to the master device.

**2.** The digram below shows how multiple batteries should be connected in a master, slave arrangement, with port 1 on the master battery being the link between the battery bank and the connected equipment.



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