EAGLE EYE
POWER SOLUTIONS

Constant Current Load Bank

User Manual V1.2

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Introduction

The Constant Current LB-Series load banks are designed to bring smart discharging technology for users who do not need report generation or individual cell monitoring. The easy to use units are both portable, rugged, and easy to setup. The auto-sensing capability of the load cables give live feedback from the battery system. This means any time the unit is powered on and connected to a battery system the user will be able to see the live readout of the total system voltage.

The units are selectively programmed by the user based on total under voltage, discharge current, discharge capacity, and discharge time duration. Once these parameters are set, the test can begin. If any (1) of the parameters are met the test will stop. A unique LB-CC feature, found elsewhere only in advanced models, is at any time during a test the discharge current can be modified by the user. This allows users to effectively use the load banks in a constant-current load step function.

In the following pages you will learn how to operate and maintain your Eagle Eye constant current load bank. We recommend you review the equipment safety warnings.

Main Features

1. Automatically stores last set parameter settings for discharge test
2. Safety cut-off feature automatically stops discharge current if **any** (1) of the following parameters are met: Time complete, capacity met, or under voltage reached
3. The load bank will stop discharging and alarm if **any** of the following safety protections are met: Internal unit temperature (overheating), improper load connection (polarity), or loss of connection to battery bank
4. Max discharge load available in ≤ 2 seconds
5. Bright LED displays voltage, current, capacity, and time
6. 4-directional keypad with (5) button commands for setting test parameters
7. 2 step start and stop command to prevent accidental start/stop of discharge test
8. Auto sensing of battery system voltage makes test setup simple and easy
9. Large units are equipped with dual lift handles and robust 360° locking wheels for maximum portability
10. Critical electrical components are in a secured, separate compartment, away from resistors and fans

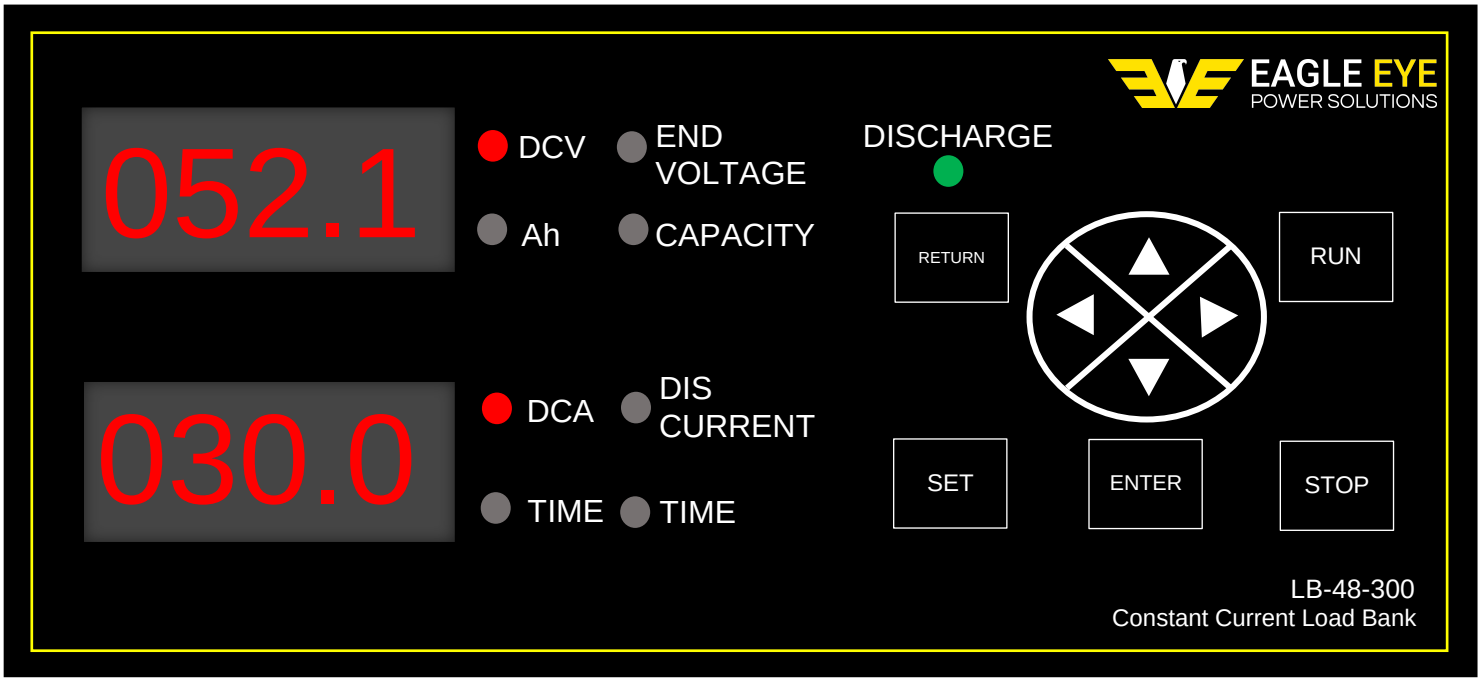
1. Load Bank Operation

1.1 Appearance

1. Positive load cable connection
2. Negative load cable connection
3. Display for DCV or Ah while testing, and for end voltage or capacity when setting parameters
4. Display for DCA or Time while testing, and for discharge current or time when setting parameters
5. LED light illuminates when associated detail is selected
6. (4) direction navigational keypad
7. (5) command buttons; return, set, enter, run, stop
8. Power switches select either 110 or 220 VAC
9. Fuse protected AC power terminal input

1.2 Interface Overview

Shown below is a rendering of the CC main user interface. We will use this rendering to detail the different features and functions of the unit in the following pages.



In the above example, you will notice there are (3) LED lights illuminated. The green DISCHARGE LED appears when a discharge test is active while the (2) red LEDS are showing which values are currently being displayed.

1.3 Interface Symbols

DCV is the live total DC voltage reading from the connected battery system

Ah shows the amp hours removed from the battery system

DCA is the live current load on the system

TIME shows the duration of time that has elapsed for the current test / desired total test time when setting test parameters

END VOLTAGE is used for setting the battery system total end voltage cut-off parameter

CAPACITY is for setting the battery capacity to be discharged

DIS CURRENT is for setting the discharging current load

1.4 Keypad Functions

DISCHARGE will illuminate green when a test is active and blink when awaiting test begin or end confirmations

RETURN exits the current setup back to the live view mode

SET takes you to the parameter setting mode

ENTER has two functions, (1) it will save the current input parameter setting (2) it will begin or stop testing after pressing either RUN or STOP

RUN initiates a test to begin

STOP initiates a test to end

▲ moves viewing LED up

▼ moves viewing LED down

◄ used in SET mode; decreases the selected parameter setting value

► used in SET mode; increases the selected parameter setting value

2. Discharge Setup

Refer to our safety recommendations found prior to performing any discharge testing. You should always also follow general safety guidelines outlined by your organization when working with high voltage battery systems.

Prior to beginning the connection workflow below, verify you have all necessary equipment.

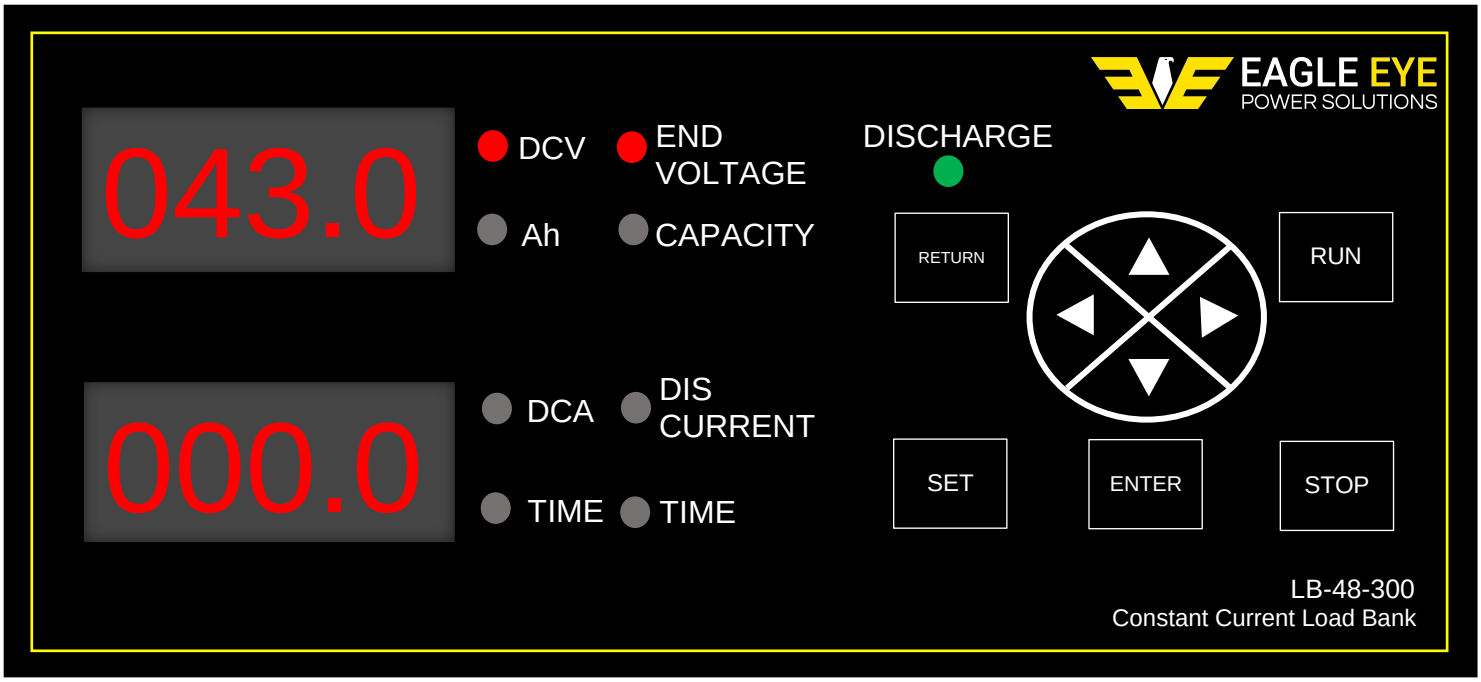
The workflow for connecting an LB-Series CC load bank to a battery system are as follows:

1. **The load bank should be placed as far from the battery bank and any obstructions as possible. The unit's fan intake and exhausts should NEVER be blocked.**
2. **Lock the load cables into the matching color coded terminals of the load bank. Once connected attach the battery bank terminals. Black to negative, red to positive.**
3. **Insert the provide AC power cord and turn on the appropriate power switch; 110 or 220 VAC 50/60Hz**
4. **The load bank will auto-sense the attached voltage and you are able to program the load.**

2.1 Programming Test Parameters

To program test parameters for the LB-Series CC load bank, press the SET key after powering on the unit. When you enter SET mode, two LEDs will be lit for the setting you are currently modifying.

The previous test parameters are stored on the load bank.



As shown in the above example, the user has entered the SET mode and is currently able to modify the END VOLTAGE setting.

To modify the end voltage value, use ◄ to decrease or ► to increase.

REMEMBER: If you move ▼or ▲ to the next SET parameter without pressing the ENTER key, the changed setting will not be saved and the unit will revert back to the previously saved value.

Press ▼ to move down to modify the CAPACITY setting. Once desired value is chosen, press ENTER to save. Repeat this process for DIS CURRENT and TIME setting.

Once all parameter settings are set to user specifications, pressing RUN will initiate the test sequence and the green DISCHARGE LED will begin blinking. Pressing ENTER will confirm the RUN key command and the test will begin.

2.2 Discharge Testing

Once the discharge test has begun the unit will display the live readout of the total voltage and the discharge current load. The load test will automatically stop if any of the user's set parameters are met OR testing can be manually stopped by pressing the STOP key and confirming the command by pressing ENTER. All load will be discontinued and the unit fans will remain on for at least 5 minutes before automatically shutting off. If the discharge were to automatically shut down due to meeting a parameter setting, the unit will audibly alarm until the user presses the ENTER key.

REMEMBER: Pressing RETURN prior to pressing ENTER will cancel the STOP command and continue the discharge test.

2.3 Modifying a Discharge Test

At any point during an active discharge test the user can modify the test in real time by pressing the SET key and then program the new values for any parameter as described in section 2.1.

When modifying the settings, pressing ENTER will save the setting and the live load will move to the newly saved setting. This is especially important to remember when modifying the discharge current setting.

2.4 Completing the Discharge Test

When the testing has completed, remove the load cables from the battery bank and then from the load bank. Once the fans have shutdown power the unit off and remove the AC power cable.

3. Troubleshooting

Below are some of the basic error codes and descriptions that a user may incur over the lifetime of an LB-CC unit. If you find that your unit has incurred one of these errors or are experiencing an error not found below, please contact Eagle Eye support.

The CC series have built in protection features to help prevent the unit from becoming damage due to improper connections or use. When the unit senses an issue, it will respond by alarming, giving an error code, and an indicator light will activate. For example, if a voltage threshold is alarming, the unit will display the real value it is detecting and also what error code it is experiencing (Err. 2 or Err. 3).

3.1 Error Codes

Displayed Error Code	Description
Err. 2	Voltage measurement is higher than 65V
Err. 3	Voltage measurement is lower than protected voltage
Err. 4	Testing cable connection fault/not receiving measurement data
Err. 5	Overflow current/faulty current output
End. 6	Discharge test has concluded due to time out (duration completed)
End. 7	Discharge test has concluded due to capacity being reached
End. 8	Displays when manually stopping a discharge test

3.2 Calibration

Adjusting the measurement readings on the LB-Series CC load bank can be performed by field technicians. The following will explain how to adjust both the voltage and current (load) values. You will need to have a multimeter that is calibrated and measures voltage and also has a clamp for amp measurements.

Prior to a discharge test users are able to calibrate the voltage readout on the unit. To do this:

1. Connect the load bank to the battery system as described in the connection workflow. Once connected, power the unit on.
2. When powered on, press ►, **Run,** ◄ to enter the voltage calibration menu. The top LED will show the current setting, while the bottom LED will show you the new modifiable voltage value.
3. Press ◄ or ► to decrease or increase the voltage value, then press **Enter** to save.
4. Pressing **Return** will return you to the normal operation interface or pressing **Set** will restore factory defaults.

During a test users are able to calibrate both the voltage and current values of the load bank. To do this (during an active discharge):

1. Press ►, Run, ◄ to enter the voltage calibration menu. The top LED will show the current setting, while the bottom LED will show you the new modifiable voltage value.

2. Pressing ▼**or** ▲ will switch between voltage or current (voltage displays first).
3. Input real value by pressing ◄ or ► to decrease or increase value to match test meter.
4. Press **Enter** to save. Press **Return** for the normal operation interface, or press **Set** to return factory default settings.

4. Equipment and Safety Warnings

- Before testing, verify that the nominal voltage range on the load bank matches the battery system being tested
- Use only approved load cables with the load bank
- The load banks are designed for 120 or 220 VAC 50/60Hz. Do not connect to voltages or frequencies outside of these ratings
- After discharging batteries, keep the unit powered on at least 10 minutes or until the automatic fan shutdown occurs
- The electrical currents and voltages use by battery systems and testing are hazardous and potentially lethal. Always use equipment safely
- Prior to performing any maintenance or cleaning always disconnect from power sources
- Do not touch load cables conductor ends when connected to batteries
- Always place the load bank as far from batteries as possible, away from obstacles and debris
- Excessive or improper discharge can cause thermal run away and/or an explosion
- If you see any sparking from the batteries or load bank, immediately shutdown and disconnect the unit, cables, and batteries. Then verify if any components are damaged before attempting testing again

5. Equipment Checklist

The following items come standard with the Eagle Eye constant current load banks

1. Positive and negative 3-meter (10ft.) load cables. Quantity varies with different current outputs
2. Either 120 or 220 VAC power cable
3. Main load bank body
4. Eagle Eye USB drive containing support literature

6.Technical Specifications

Discharge Voltage Range:	5 – 600V (Auto-Sensing)
Discharge Current Range:	1 – 2000A
Accuracy:	Discharge Current: +/- 1% / Voltage: +/- 1%
Resolution:	Discharge Current: 0.1A / Voltage: 0.1V
Display:	Backlit Numeric LED
Operating Environment:	0 – 40 °C (32 – 104 °F)
Power Requirements:	110/220 VAC 50/60 Hz

7. Contact Us

If you have any questions or comment, please contact Eagle Eye Power Solutions. You can reach our team any of the following ways.

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