

Lester Electrical

High-tech meets the Heartland

Lester Electrical Confidential | May 2018

The background of the slide is a dark, high-contrast image of a circuit board, showing intricate patterns of lines and components. The text is overlaid on this background.

We develop solutions for electrical power conversion and monitoring designed to enhance the value to our customers and those they serve in industrial, commercial, and professional electrical power markets.

Respect the past, power the future.

Company History

1960's

The company is established by Lanny Carrier & Don Wilson to produce chargers for Cushman with 4 employees in 3,000 sq. ft. of leased space. The 36S2T12 is the company's first charger.

1970's

Release of DV/DT patented charge control with the first Lestronic I charger, still an industry standard used today.

1980's

Lester Electrical of Nebraska Inc. established as an ESOP, becomes an employee owned company.

1990's

The first stationary/reserve power product line is introduced. Lester Electrical becomes the leader in select industrial stationary markets.

2000's

The Lester Electrical quality assurance (QA) systems receives ISO 9001 certification.

2010's

The first Summit Series switch mode batter chargers are introduced, setting a new standard for charge control, efficiency and reliability.

Executive Leadership



Spencer Stock

President and CEO

10 years with company



Lauri Earhart

Director of Human Resources

39 years with company



Brian Beckham

Director of Product and Project Strategy

11 years with company



Steve Rogers

Director of Operations

1 year with company



Jamie Jesse

Vice President of Engineering

31 years with company



Dave Herbers

Director of Sales and Marketing

10 years with company



Kimberly Williams

Director of Finance and Accounting

7 years with company



Lester Electrical Team

Selected by Leading Companies



Applications



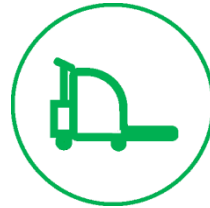
Outdoor
Power



Floor Care
Machines



Golf Cars /
Electric Vehicles



Material
Handling



Industrial/Utility
Vehicles



Aerial Work
Platforms



Landscape
Lighting



Power
Sports



Electric
Motorcycle



Railroad



Utility



Genset

Engineering Expertise

Electrical power conversion, monitoring, and storage experts

Manufacturing Engineering
Industry Leading Staff

Application experts
Algorithm development experts
Deep-cycle battery expertise

Test Engineering
Design Engineering

Power electronics
Control electronics
Mechanical
Embedded software
App software

Testing Laboratory



- ✓ Battery profile validation
- ✓ Battery life cycle testing
- ✓ Efficiency regulation testing (CEC, DOE, etc)

- ✓ 64 test stands
- ✓ Fully automated
- ✓ Complete data acquisition



Testing Laboratory

- ✓ We are a California Energy Commission (CEC) approved laboratory
- ✓ Efficiency certification testing performed in-house


The screenshot shows the California Energy Commission (CEC) website interface. At the top, the CEC logo and name are displayed, along with navigation links for 'HOME' and 'SEARCH'. Below this is a 'Company Search' section with a prompt to 'Enter company search criteria and click search to view results'. The search criteria include: Company Name (Lester Electrical), Country (Please Select), Company Type (Test Lab), Company Status (Approved), Approval Start Date, and Approval End Date. A 'Search' button is located to the right of the date fields. Below the search criteria, the 'Search Results' section shows '1 record(s) found'. To the right of the results is an 'Export To:' section with buttons for 'Excel' and 'CSV'. The search results are displayed in a table with the following data:

Select	Company	Type	Address1	City	State	Country
	Lester Electrical	Test Lab	625 West A Street	Lincoln	Nebraska	USA

At the bottom of the page, there is a footer with links for 'Conditions of Use' and 'Privacy Policy', and a copyright notice for 1994-2015 California Energy Commission, All Rights Reserved, State of California, Edmund G. Brown Jr., Governor.

Compliance Testing





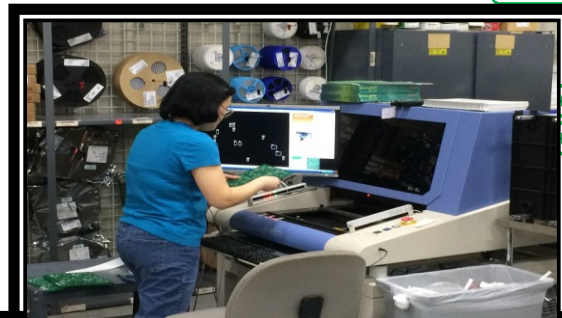
A worldwide leader in
industrial/commercial battery chargers

Manufacturing

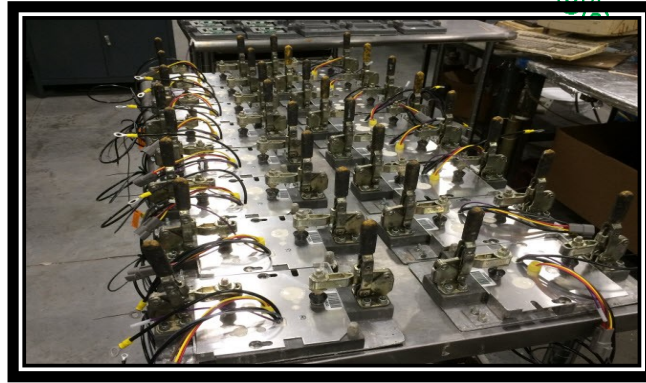
- ✓ 90,000 square feet facility in Lincoln, Nebraska
 - ✓ 61,000 (Manufacturing)
 - ✓ 15,800 (Warehouse)
- ✓ ISO 9001 Certified
- ✓ Vertically Integrated Manufacturing
- ✓ ODM and OEM Supplier
- ✓ Two shifts, five days per week

Electronic Assembly

- ✓ PCB Assembly
- ✓ IPC Certified
- ✓ Surface Mount Technology (SMT)
- ✓ Automated Optical Inspection (AOI)
- ✓ Through Hole
- ✓ Ruggedization Capabilities
- ✓ Potting
- ✓ Conformal Coating



Electronic Assembly



Cable/Wire Assembly and Transformers

- ✓ Cable/wire assembly
 - ✓ Cutting, stripping, termination
 - ✓ 20 to 3/0 AWG
- ✓ Transformers
 - ✓ Up to >13 kW
 - ✓ Automatic winders for 22 to 9 AWG
 - ✓ E/I laminations automatic welding



Sheet Metal and Powder Coating

- ✓ Sheet metal
 - ✓ Automated turret presses
 - ✓ Press brakes
 - ✓ Automated deburring
- ✓ Powder coating
 - ✓ Aqueous parts washer
 - ✓ Powder coat booth
 - ✓ Cure oven



Molding

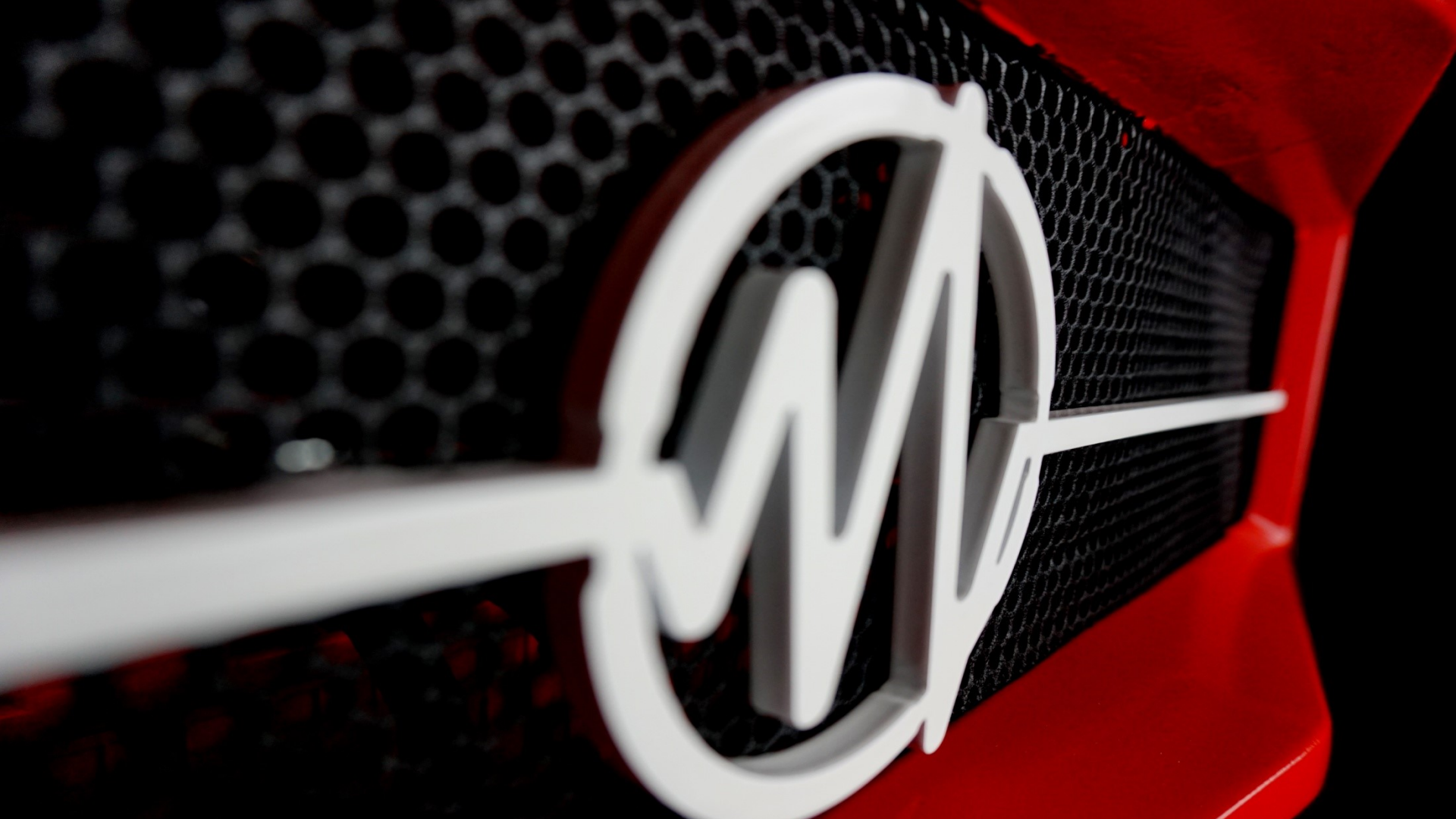
- ✓ DC plug/receptacle systems
- ✓ Highest performance in the industry
- ✓ In-house molding machines
- ✓ Proprietary materials
- ✓ Proprietary quality control processes



Electromechanical Assembly

- ✓ Electronic assembly
- ✓ Final assembly
- ✓ Automated Test Systems (ATS)
- ✓ Burn-in capabilities
- ✓ Assembly areas with design and flow per Kazan
- ✓ Flexible assembly options to meet specific requirements





Product Highlights



SUMMIT™ SERIES

BATTERY CHARGERS



Models and Options



650W

- 24V/27A (29300)
- 36V/18A (29900)
- 48V/13.5A (29700)
- 36V-48V/18-13.5A, auto-voltage (30600)



1050W

- 36V/25A (29400)
- 48V/22A (28740)
- 24V-48V/25A-22A, auto-voltage (30400)



1425W *Released in 2019*

- 24V/40A (29500)
- 36V/40A (29600)
- 24V-36V/40A, multi-voltage (30500)

Market Leading Features



Bluetooth Communication



Compact



Durable



Cloud Connectivity



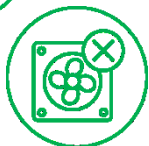
Best in Class Efficiency



Industrial Construction



Lithium Compatible



Natural Convection Cooled



Expert Development



Leading Performance



Worldwide Use



CAN bus communication



Easy User Interface



Auto Voltage Sensing



Data Collection

Delta Electronics

Industry Leading Expertise

Largest power conversion electronics manufacturer in the world

World Renown Quality

Mission-Critical Infrastructure Business Unit

World's premier manufacturer of high-reliability power conversion electronics

Precision Robotic Labor



Summit Series II – Features

- Universal AC input with IEC inlet
 - 85-265 Vac, 45-65 Hz
- On-board (built-in) and off-board (shelf) charging
- Sealed enclosure, IP66, NEMA 4
- High reliability, durability, and longevity
- Lockout/interlock, remote LEDs, battery temperature sensor
- Best-in-class efficiency
 - California Energy Commission (CEC) and Department of Energy (DOE) compliant
- Safety/regulatory approvals
 - UL recognized/listed, cUL/CSA, CE/EN, RCM (C-Tick), FCC/ICES, CEC, DOE

Summit Series II – Features

- Low DC output ripple

- Performs better with sealed batteries

- Intelligent natural convection cooling (no fan)

- Increased durability and reliability

- External DC and signal connections

- Enabling modular, field-installable cordsets

- Industry-leading charging intelligence and performance

- *Progressive DV/DT™* charge algorithm extends life of older packs

- Auto-Voltage support

- Automatic DC output voltage detection and adjustment

- Single SKU can charge 24V/36V/48V or 36V/48V

- 200 charge cycle history records stored on the charger

Summit Series II – Features

CAN bus vehicle communication

Bluetooth wireless communication

- ChargerConnect app for Apple and Android smart phones and tablets

- View charge cycle status

- Time remaining, time elapsed, current, voltage, amp-hours,

- Select the active charge profile

- Upload new charge profiles to the charger

- Download charge cycle history records to smart device

Cloud connectivity via the app

- Download new charge profiles from the Cloud

- Push charge cycle history records to the Cloud

phase, faults

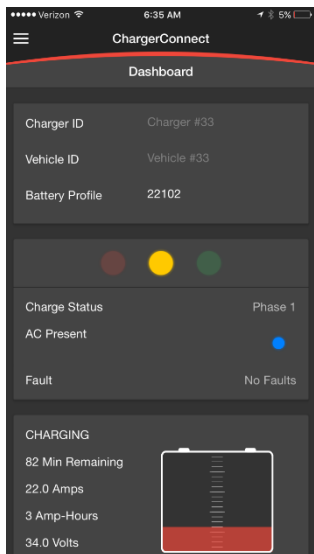
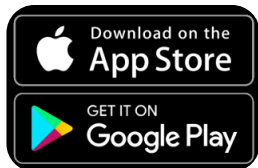


CAN

Charger Connect App



Apps for Apple iOS and Android phones, tablets, or similar devices



View charge cycle status

- Time remaining, time elapsed, current, voltage, amp-hours, phase, faults

Select the active charge profile

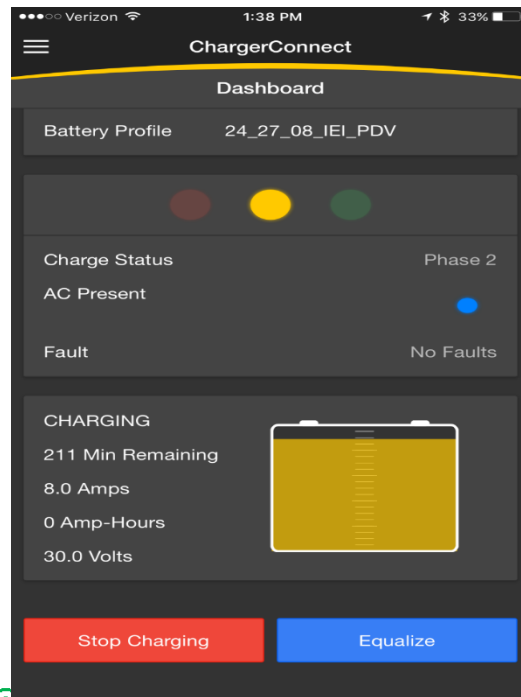
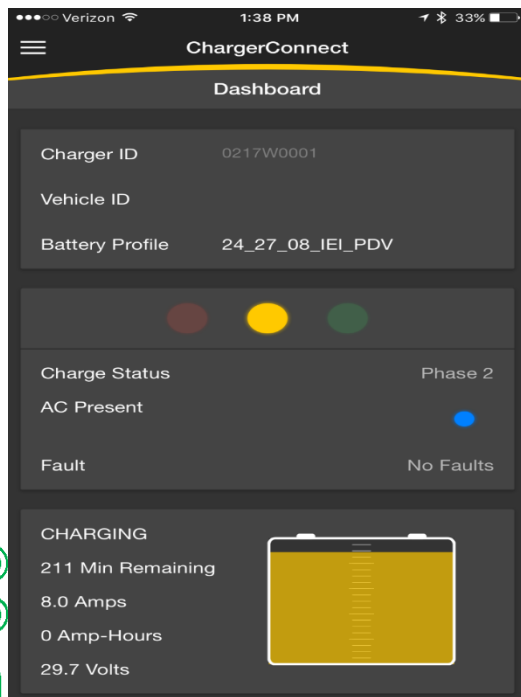
Upload new charge profiles to the charger from device

Download charge cycle history records from the charger to device

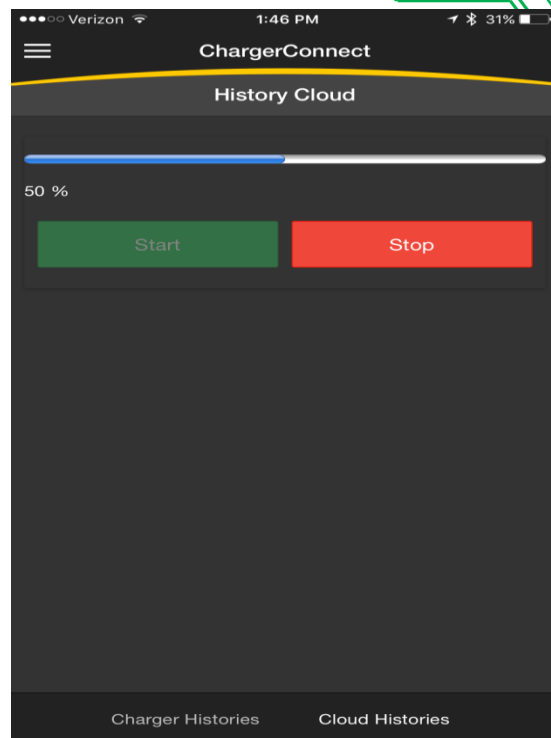
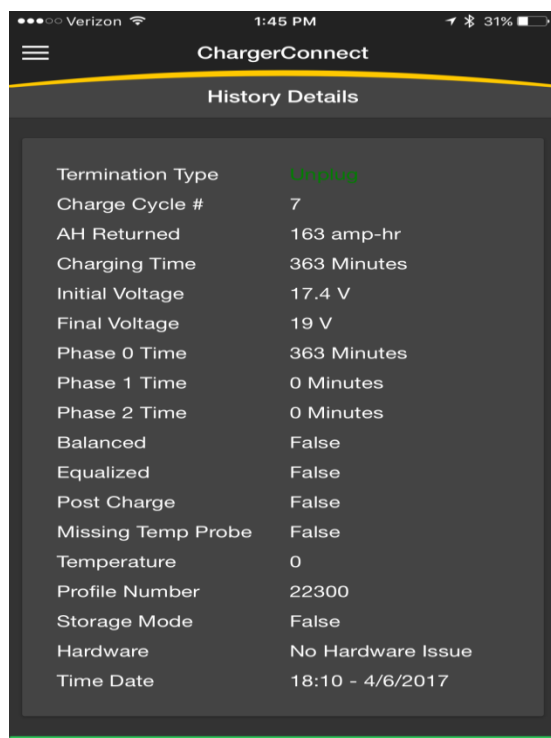
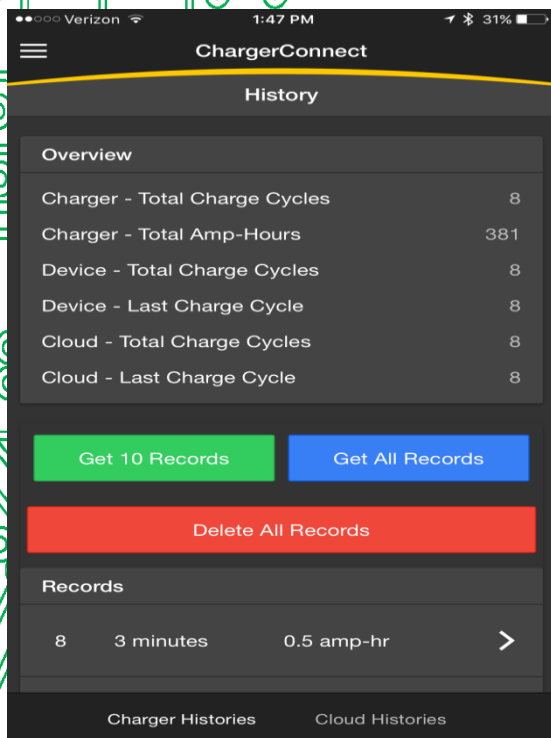
Download new charge profiles from the Cloud to device

Upload charge cycle history records to the Cloud from device

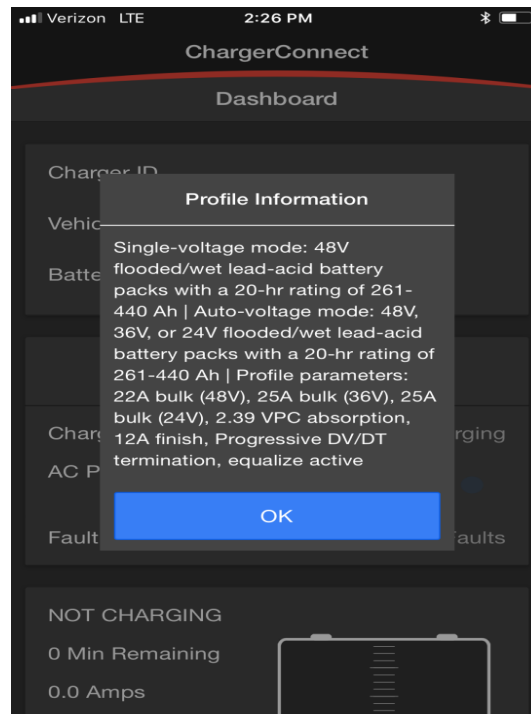
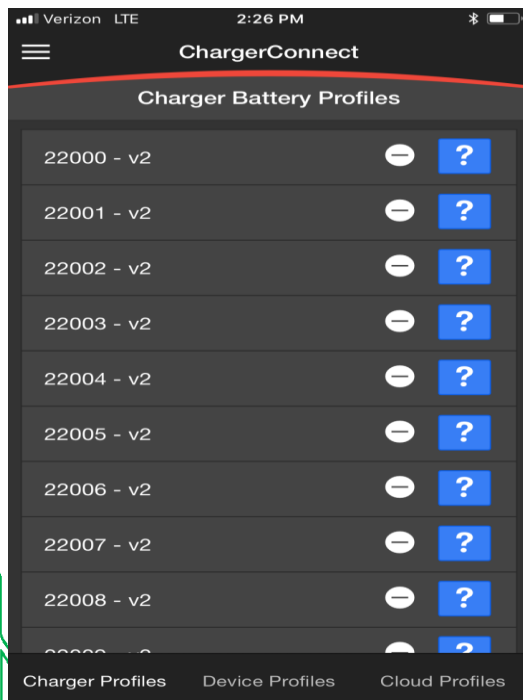
ChargerConnect App



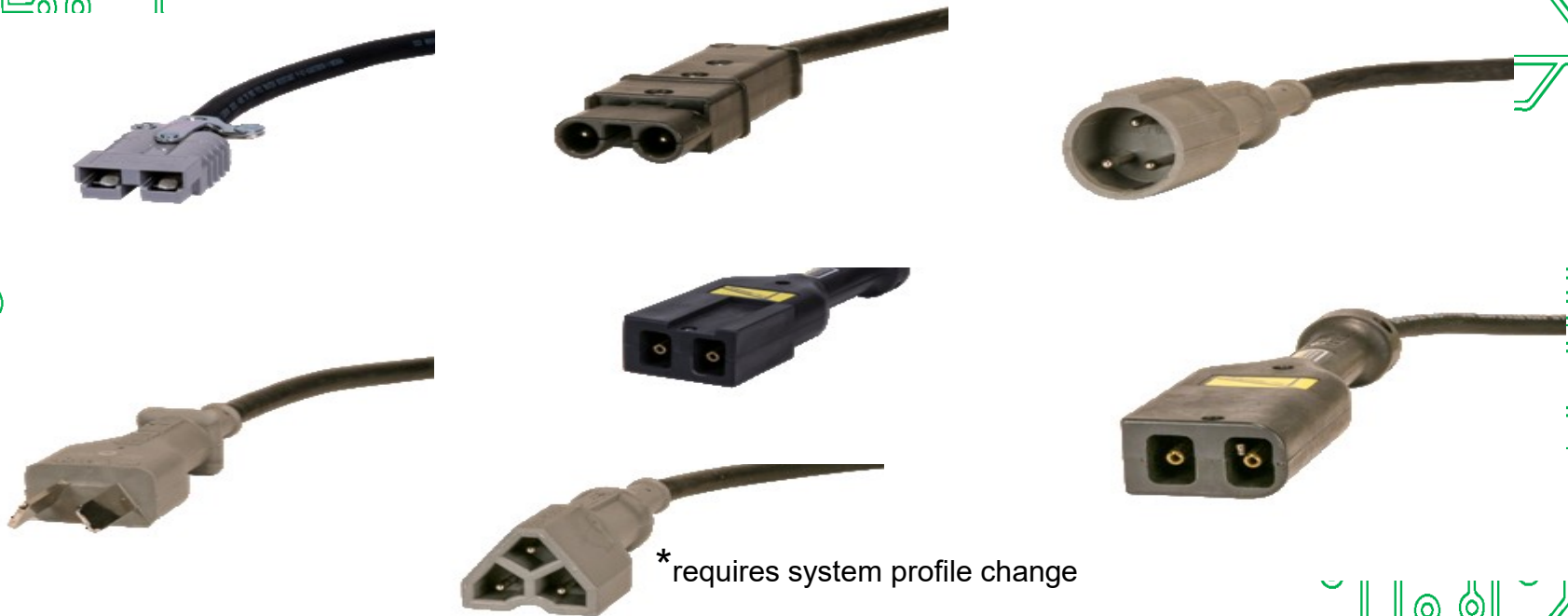
ChargerConnect App



ChargerConnect App



Summit Series DC Cordsets



*requires system profile change

App Help / User Guide

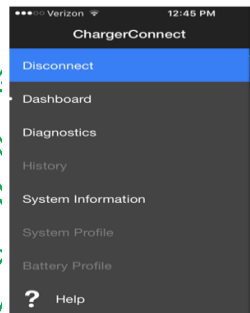
25 page, step-by-step instructions for user

Navigation Menu

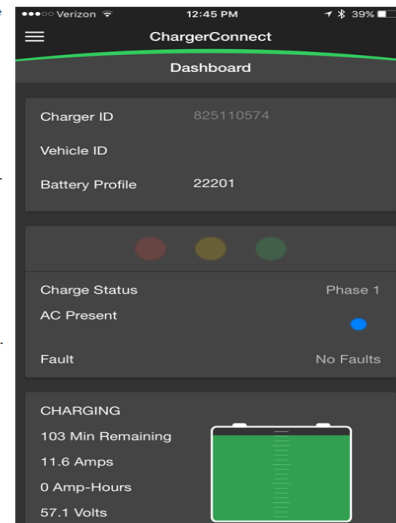
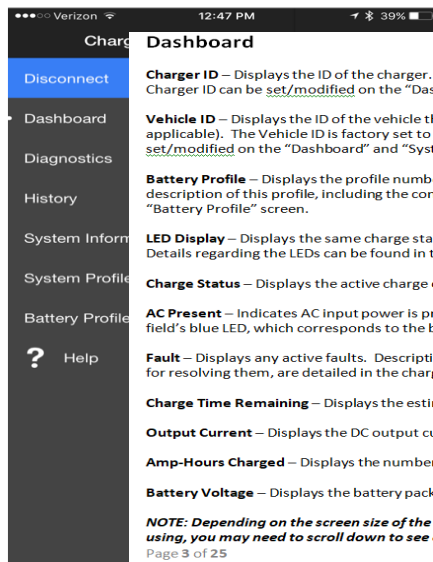
The Navigation Menu can be accessed by tapping the three (3) horizontal lines in the upper left-hand corner of the app.

Disconnect – This menu item disconnects the Bluetooth connection between the charger and your smart phone or tablet (device) and returns you to the “Connect” screen.

Note: If the connected charger is actively charging, the “History”, “System Profile”, and “Battery Profile” menu items will be disabled. The “Manual Stop/Start Button” on the “Dashboard” screen can be used to (1) stop the active charge cycle in order to access these menu items and (2) start a new charge cycle prior to disconnecting from the charger.



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NOTE: Depending on the screen size of the smart phone or tablet (device) you are using, you may need to scroll down to see all of the fields.

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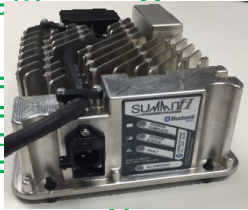
Profile Guide

Choosing the right battery profile

Model 29700 (48V/650W)

Battery Type	Battery Capacity (Ah, 20-hr Rate)	Profile Description	Profile Number
Flooded/Wet	105-149	Single-voltage mode: 48V flooded/wet lead-acid battery packs with a 20-hr rating of 105-149 Ah Auto-voltage mode: 48V or 36V flooded/wet lead-acid battery packs with a 20-hr rating of 105-149 Ah Profile parameters: 13.5A bulk (48V), 18A bulk (36V), 2.39 VPC absorption, 4A finish, Progressive DV/DT termination, equalize active	22200
Flooded/Wet	150-204	Single-voltage mode: 48V flooded/wet lead-acid battery packs with a 20-hr rating of 150-204 Ah Auto-voltage mode: 48V or 36V flooded/wet lead-acid battery packs with a 20-hr rating of 150-204 Ah Profile parameters: 13.5A bulk (48V), 18A bulk (36V), 2.39 VPC absorption, 6A finish, Progressive DV/DT termination, equalize active	22201
Flooded/Wet	205-260	Single-voltage mode: 48V flooded/wet lead-acid battery packs with a 20-hr rating of 205-260 Ah Auto-voltage mode: 48V or 36V flooded/wet lead-acid battery packs with a 20-hr rating of 205-260 Ah Profile parameters: 13.5A bulk (48V), 18A bulk (36V), 2.39 VPC absorption, 8A finish, Progressive DV/DT termination, equalize active	22202
AGM	85-260	Single-voltage mode: 48V AGM lead-acid battery packs with a 20-hr rating of 85-260 Ah Auto-voltage mode: 48V or 36V AGM lead-acid battery packs with a 20-hr rating of 85-260 Ah Profile parameters: 13.5A bulk (48V), 18A bulk (36V), 2.45 VPC absorption, DI/DT termination, 2.27 VPC float	22209
Gel	85-260	Single-voltage mode: 48V Gel lead-acid battery packs with a 20-hr rating of 85-260 Ah Auto-voltage mode: 48V or 36V Gel lead-acid battery packs with a 20-hr rating of 85-260 Ah Profile parameters: 13.5A bulk (48V), 18A bulk (36V), 2.38 VPC absorption, DI/DT termination, 2.25 VPC float	22210

Golf Cars & NEVs/LSVs



- Summit Series II 650W
 - 48V/13.5A, 36V/18A (Auto-Voltage)
 - Fleet golf cars, NEVs/LSVs, aftermarket golf cars



- Summit Series II 48V/1050W/22A
 - NEVs/LSVs



Industrial & Utility Vehicles



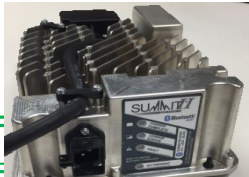
- Summit Series II 1050W
 - 48V/22A, 36V/25A, 24V/25A (Auto-Voltage)



- Summit Series II 650W
 - 48V/13.5A, 36V/18A, 24V/18A (Multi-Voltage)
- Summit Series II 650W
 - 24V/27A



Floor Machines



- Summit Series II 1050W
 - 36V/25A, 24V/25A (Auto-Voltage)
- Summit Series II 650W
 - 36V/18A, 24V/18A (Auto-Voltage)
- Summit Series II 650W
 - 24V/27A
- Summit Series II 1425W
 - 36V/40A, 24V/40A (Auto-Voltage)



Aerial Work Platforms (AWPs)

- Summit Series II 1050W
 - 48V/22A, 24V/25A (Auto-Voltage)
 - 48V: Boom lifts
 - 24V: Scissor lifts
- Summit Series II 24V/650W/27
 - Scissor lifts



Material Handling



- Summit Series II 1425W
 - 24V/40A, 36V/40A (Auto-Voltage)
 - Single-shift applications
 - On-board pallet trucks
- Summit Series II 24V/650W/2
 - On-board pallet trucks
 - Single-shift applications



Supporting Product Lines

DC Plugs & Receptacles



- Industry leader in DC plug/receptacle systems for golf cars and utility vehicles.
- Designing and manufacturing these systems since 1960's
- Widely considered the highest performing in the industry for over 20 years.
- Proprietary materials
- Proprietary quality control process
- In house molding machines

Links



- 48V/17A
- Made in the USA
- Designed for use with Club Car cars 2013 and older (with OBC).

Dischargers



- Fully portable
- Worldwide operation
- DC Powered from the connected battery set (no AC power required)
- Automatic battery discharging
- Programmable discharge cycle termination (voltage or time)
- Display
- Laptop / PC Interface

The background of the slide is a dark, high-contrast image of a circuit board, showing intricate patterns of lines and components. The text is centered over this background.

Thank you

Rosli Zainol (Ross)
Director, Business Development
Lester Electrical
625 West A Street, Lincoln Nebraska
402-477-8988

www.LesterElectrical.com