

CRAGG RAILCHARGER™ Instruction Manual for

20SMC-12V

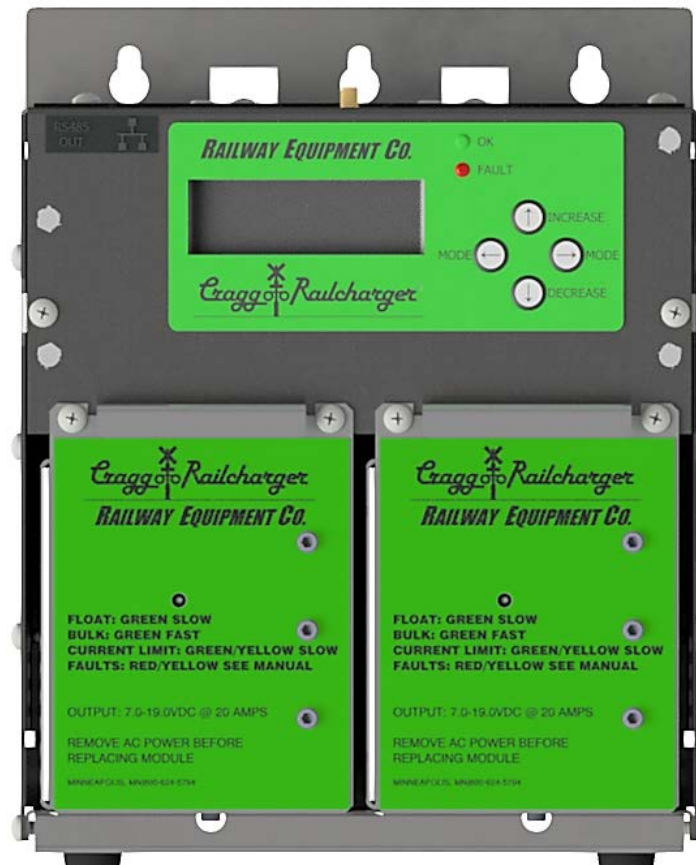
20SMC-24V

40SMC-12V

40SMC-24V

60SMC-12V

80SMC-12V



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1 WARNINGS, CAUTIONS, AND NOTES

Please read the entire instruction manual before using the battery charger.

Also, read the warnings, cautions, and notes in Table 1. Failure to observe the warnings and cautions can lead to equipment damage or personal injury.

If you have any questions concerning the manufacture, design, function, installation, operation, or maintenance, contact Railway Equipment Company before proceeding.

Table 1: Warnings, Cautions, and Notes

Symbol	Description
	WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
	CAUTION indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate personal injury. It may also be used to alert against unsafe practices.
NOTE	NOTE indicates explanatory information that applies to the next step in the procedure. It is used to clarify and expand upon the importance of the procedural step when needed.
	Hook up all DC connections before energizing the AC power, if the red led is on or the DC fuse blows you have hooked up the DC connections incorrectly.



WARNING: HIGH LEAKAGE CURRENT. EARTH CONNECTION IS ESSENTIAL BEFORE CONNECTING SUPPLY.



WARNING: Do not use this charger to recharge non-rechargeable batteries.



WARNING: Before connecting power to the battery charger, make sure AC power is turned off. Connect AC power to the battery charger per label above the WAGO terminal blocks.



WARNING: The appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.

2 DESCRIPTION

The SMC charger has an input voltage range of 115-230VAC, with a DC output voltage of 7-18.8VDC or 24 to 42.5VDC, depending on the model. Depending on the model, the DC output current ranges from 20A to 80A. The SMC has an operating temperature range of -40°F to +158°F (-40°C to +70°C) allowing it to work effectively in a wide temperature range.

The SMC also has a Temperature Compensation feature. Using the optional RTD Temperature Sensor, the charger can adjust the DC Output based on the temperature reading of the battery, thereby extending the life of the battery, and adhering to the manufacturer's specifications. Contact Railway if you need a longer temperature probe.

A remote voltage sense capability is used to compensate for voltage drop across wires between the charger and the battery.

A set of contacts are provided for monitoring the High and Low Battery Voltage, Current, AC power loss, and Temperature alarms, which have user-defined settings.

3 FEATURES

3.1 Standard Features

- Fully Automatic Charging
- Convection Cooled
- For use with Lead Acid and NiCad Batteries
- Temperature Compensation with Controlled Limits
- Adjustable Current Limit
- Battery Voltage Monitor with Relay Output
- Remote or Local Battery Voltage Sensing
- Equalization Feature to Extend Battery Life
- WAGO Terminals
- AC & DC Circuit Transient Protection
- Meets or Exceeds AREMA Specifications
- Rack Mounting Kit Available
- AC Input 115-230VAC 50, 60 Hz
- Operating Temperature -40°C to +70°C (-40°F to +158°F)
- ±1% Voltage Regulation
- <100 mV Volt Peak to Peak Output Ripple
- 2-Year Warranty

3.2 Optional Features

- Add on board with RS485 Port for Current Monitoring and Ethernet Port for Monitoring and Configuration.
- RTD Temperature Sensor that can be used with Temperature Compensation enabled.

3.3 Charger Regulation

The charger will regulate output voltage to less than ± 1 percent from full load to no load with a supply voltage of 115-230VAC. The output ripple is less than 100mV at any load.

3.4 Top Panel Features and Components

This section describes the features and components that are on the board of the battery charger (see Figure 1).

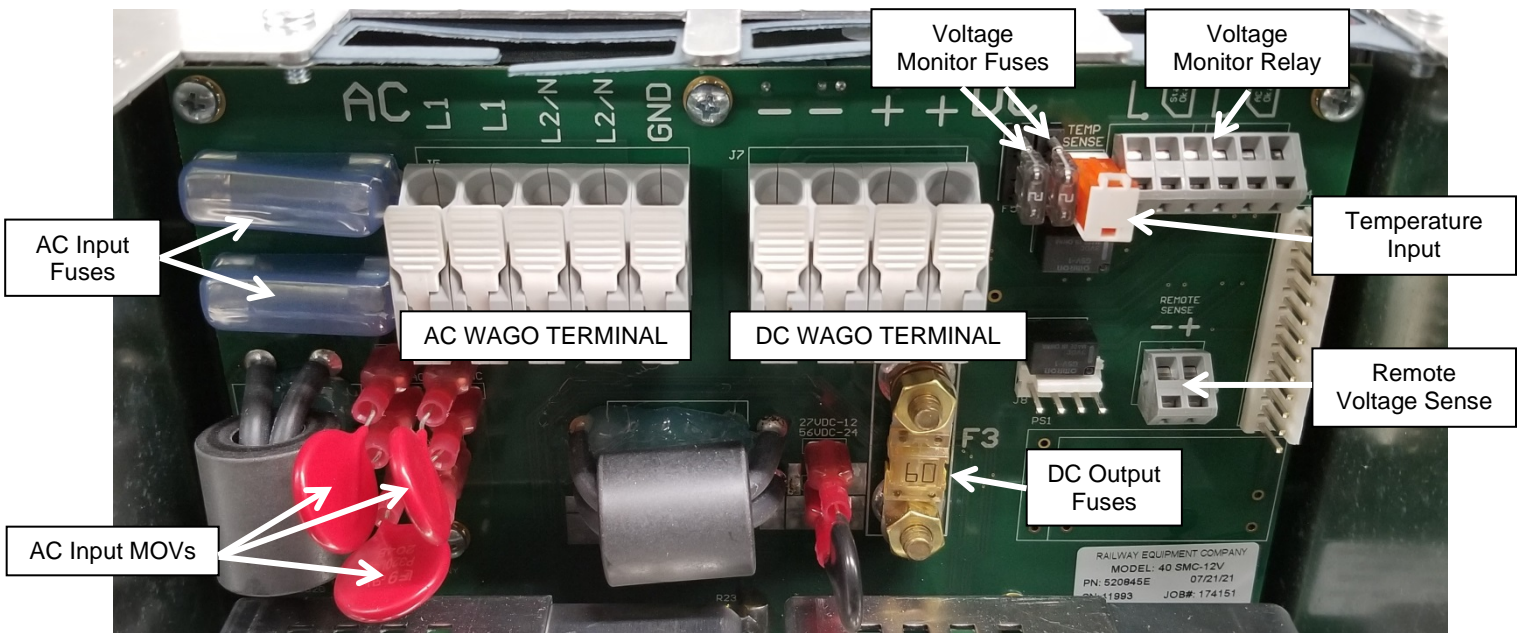


Figure 1: Front of Board of the Charger (Model 40SMC-12V)

3.4.1 AC WAGO Terminal and MOVs

The AC terminal block has connections for the AC power. The battery charger is capable of 115V-230V input. The MOVs are used to protect the charger from voltage spikes. There is a set of three MOVs installed for the AC input and one installed for the output.

3.4.2 DC Terminal Block

The DC Output WAGO terminal block is labeled – and +.



CAUTION: Be sure to observe correct polarity on battery and remote sense connections.

3.4.3 AC Fuses

The AC input fuses are labeled F1 and F2. These should be replaced with MDA, 250 Volt, slow blow fuses (use Cooper Bussman® part number BK/MDA-xx or equivalent).

Table 2: AC Fuse Ratings

Model Number	MDA Fuse Rating
20SMC-12V	15 Amp
20SMC-24V	15 Amp
40SMC-12V	15 Amp
40SMC-24V	30 Amp
60SMC-12V	30 Amp
80SMC-12V	30 Amp

3.4.4 DC Output Fuse

The DC output fuses are labeled F3. This will protect the customer load and battery charger from malfunctioning. This is a BF1, 58 Volt, slow blow fuse (use Littelfuse® or equivalent).

Table 3: DC Fuse Ratings

Model Number	BF1 Fuse Rating
20SMC-12V	60 Amp
20SMC-24V	60 Amp
40SMC-12V	60 Amp
40SMC-24V	60 Amp
60SMC-12V	125 Amp
80SMC-12V	125 Amp

3.4.5 Voltage Monitor Fuse

The voltage monitor relay is protected with a 2 Amp, 32VDC, fast-acting mini fuse (use Littelfuse® part number 0297002 or equivalent).

3.4.6 Remote Voltage Sense

It is recommended that two separate wires be connected from the battery terminals to the remote voltage sensor input terminals on the charger. If the batteries, to be charged, are located more than 12 feet from the charger, there will be a significant voltage drop through the wires.

3.4.6.1 Remote Voltage Sense Installation

This is done by removing the two pre-installed jumper wires from the remote voltage sense terminals and the DC output terminals and replacing them with wires from the battery terminals to the remote voltage sense terminals. If the remote voltage sensing function is not used, leave the two jumpers from remote voltage sense terminals to the DC output terminals connected.



CAUTION: When connecting wires from the battery terminals to the charger, verify the voltage polarity.

1. Disconnect the two jumper wires from the remote voltage sense terminals inside the wire terminal area and the DC battery output terminals.

NOTE: Before connecting the two wires to the battery terminals, make sure that the polarity is correct to avoid other equipment damage and prevent personnel injury.

2. Using minimum 18GA, maximum 16GA wire, connect two wires to the remote voltage sensing input terminals using a WAGO 210-719 terminal block operating tool on the terminal insertion tabs.
3. Ensuring proper polarity, connect the two wires to the battery terminals.

3.4.7 Voltage Monitor Relay

The voltage monitor provides a Form C dry contact relay which can be used to indicate when the battery voltage, current, and temperature are either above or below the parameter settings.

The voltage monitor circuit is independent from the battery charger system and the AC power and operates from the battery voltage.

The “normally open” contact is closed when the battery voltage, current, and temperature are between the high and low settings.

The relay is rated for 2 Amps at 60VDC or 2 Amps at resistive loads. The mechanical contact life is 5,000,000 operations. Minimum inductive life @ .5 Amps, 12VDC is 50,000 times.

The voltage monitor can be used for an alarm by connecting the coil of an indication relay to the normally open relay contact terminals on the battery charger, with power for the relay supplied by others.

The voltage monitor relay is protected with a 2 Amp, 32VDC, fast-acting mini fuse (use Littelfuse® part number 0297002 or equivalent).

NOTE: Wire size should be minimum of 18GA, maximum of 16GA.

3.4.8 Temperature Input (Optional Add-On)

When the temperature sensor is connected and Temperature Compensation is enabled, the battery charger will adjust the output voltage up or down depending on the probe temperature and the Temperature Compensation Rate (refer to table 5). The probe end can be placed between battery cells to accurately monitor battery temperature. If the remote temperature sensor is not used, the temperature compensation function will be fixed at 77°F.

NOTE: The RTD Temperature sensor is optional.

P/N
3568-0015

3.5 Front Panel Features

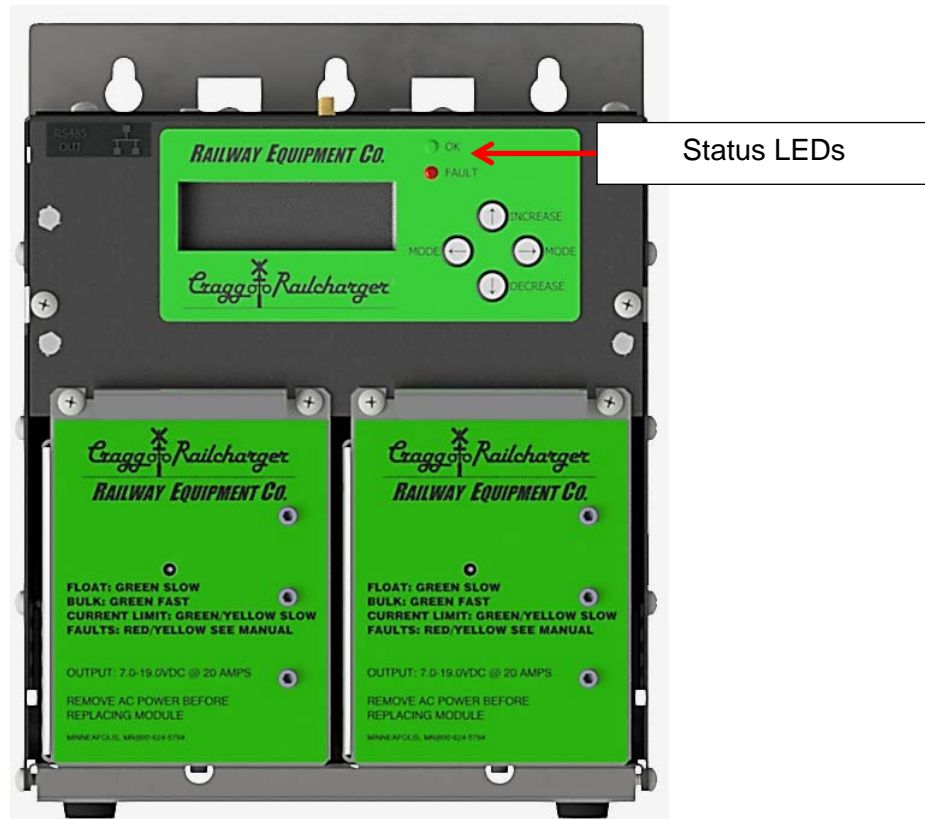


Figure 2: Front of Battery Charger (Model 40SMC-12V)

3.5.1 Display

The display is a long-life OLED display. It enters “sleep mode” after inactivity to extend the life of the display. To “wake” the display, touch any control button.

3.5.2 OK LED

The OK LED is on when the DC Output Voltage is between the HIGH VOLTAGE FAULT and LOW VOLTAGE FAULT settings.

3.5.3 FAULT LED

The FAULT LED has three different states, OFF, ON, and FLASH. In addition to the FAULT LED, the display will show a fault description. The fault conditions are described in the table below. In the case of AC Power Lost, the display will go into sleep mode after 30 seconds to preserve battery power.

Table 4: Fault LED States

Description	Fault LED (Red)
No Fault	OFF
Battery Temperature Fault	ON
DC Output Current Fault	ON
DC Output Voltage Fault	ON
Temp Comp On, No Temp Probe Connected	ON
AC Power Lost	FLASH
DC Output Fuse Blown	FLASH
DC Output Reverse Polarity	FLASH

3.5.4 Additional Features



Figure 3: Front Top of Charger

The on board provides an Ethernet port, RS485 port, and a microSD memory card slot.

- The RS485 port provides a connection to numerous devices such as the Multiple Cell Monitor Slave, Current Coil, and Current Shunt.
- This RJ45 Ethernet connection is used for accessing the charger, either via its internal webpage or via the Remote Monitoring Server.
- The MicroSD memory card slot is used to update the firmware of the charger and save logs from the charger to be viewed on a computer.

4 OPERATION

4.1 Front Panel Display and Push Button Controls

The front panel has a digital display and four control buttons. The display will auto dim after several minutes of inactivity. Once a button is pressed the display will return to full brightness.

SET-UP AND ADJUSTMENTS: To change settings do the following:

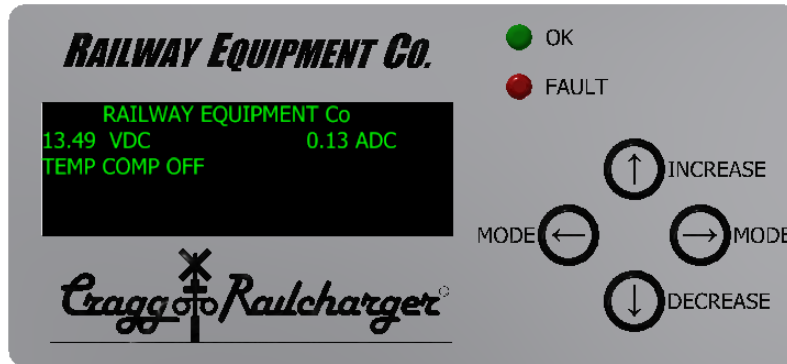


Figure 4: Push Button Controls

MODE LEFT/MODE RIGHT

Pushing the left or right mode push buttons will cycle left or right through the menus. Each time you press one of those buttons, you will advance one menu selection.

VALUES INCREASE/VALUE DECREASE

The increase or decrease push buttons allow you to change the displayed values and changed through the menu categories.

NOTE: After you have changed a value, and click either the right or left button, you will see this message, "PRESS INCREASE FOR FIVE SEC TO SAVE". If you hold the increase for five seconds, it will save that value you changed. You can also skip that message and wait 15 minutes to have values saved.

5 SMC CHARGER INSTALLATION



WARNING: Before connecting power to the battery charger, make sure AC power is turned off. Connect AC power to the battery charger per label above the WAGO terminal blocks.



WARNING: The appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.



WARNING: Do not use this charger to recharge non-rechargeable batteries.

5.1 Mounting

5.1.1 Shelf Mount

The charger is designed to allow enough airflow through the bottom of the charger when it is set on a shelf.

5.1.2 Wall Mount

Use the two-four keyed slots on the back of the charger for mounting to a wall.

5.1.3 Rack Mount

The optional Rack Mount bracket is available for purchase, see below. This is attached to the sides of the charger and allows for mounting at various depths.

Description	P/N
60/80 12V SMC Rack Mount Kit	3108-0180
20/40 12V SMC Rack Mount Kit	3108-0140

5.2 Output Connections



WARNING: Batteries being used with this charger should be placed in a well ventilated area during charging.



CAUTION: When connecting wires from the battery terminals to the charger, verify the voltage polarity.

1. Connect the wires that will go between the battery bank and the Charger to the DC Output WAGO terminal block labeled – and +.
2. Connect those wires to the battery posts. Have the positive terminal on the battery bank go to +1 or +2. Have the negative terminal on the battery bank to –1 or –2.
3. The charger should now power up from the battery.

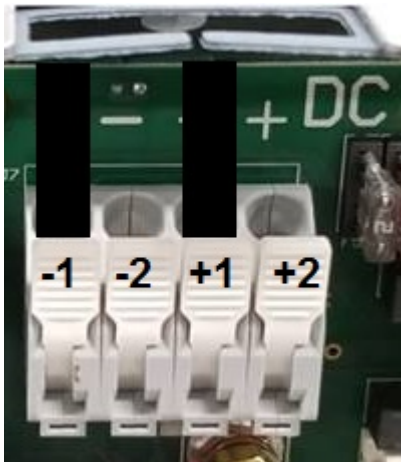


Figure 5: DC Power Side

5.3 Input Connections

1. Connect the AC wires to the AC Input WAGO terminal block. Connect LINE1 to LL1, LINE2/NEUTRAL to LL2, and GROUND to G. Refer to the image below.

2. Apply AC power to the charger.

NOTE: No connections to RL1 and RL2 are necessary.

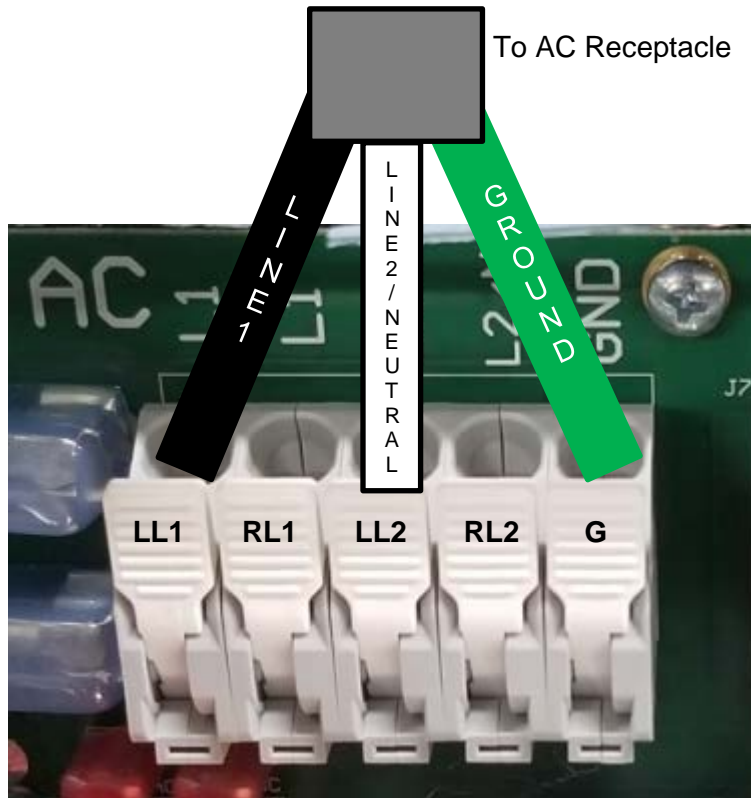
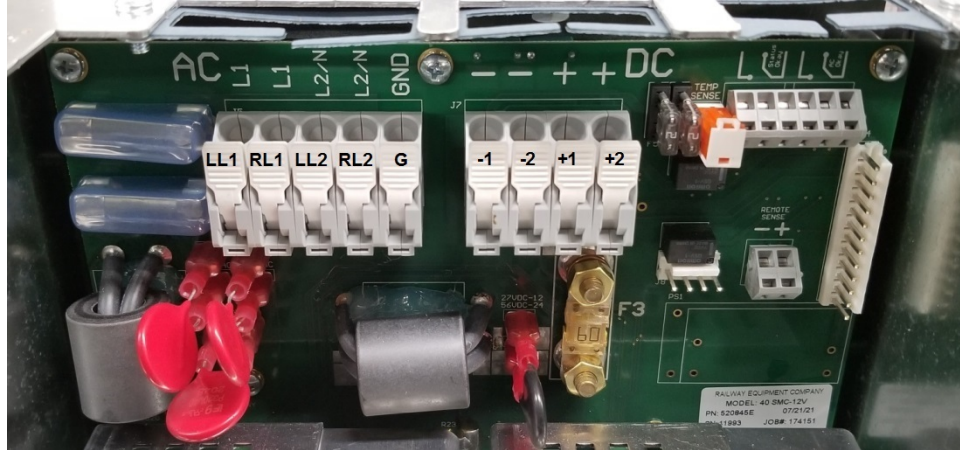


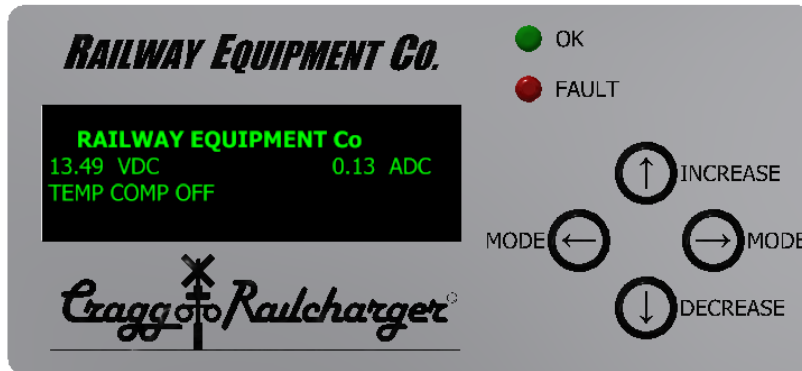
Figure 6: AC Incoming Power Side

6 BASIC SETUP PROCEDURE

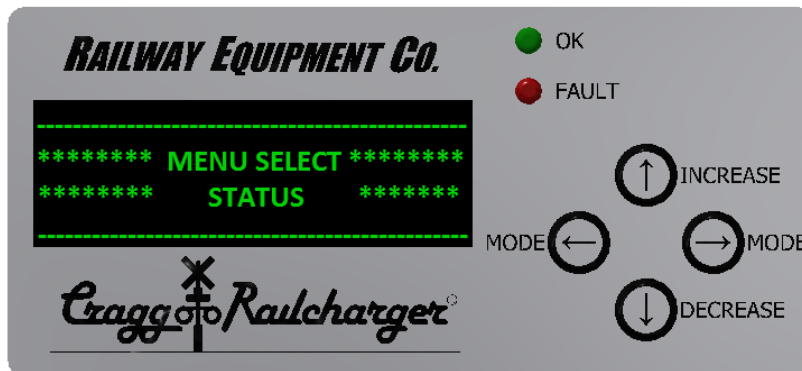
1. When you first get your SMC Battery Charger, make sure you have all the connections properly connected. Have the AC power going into the AC terminal block. Connect LINE1 to LL1, LINE2/NEUTRAL to LL2, and GROUND to G.



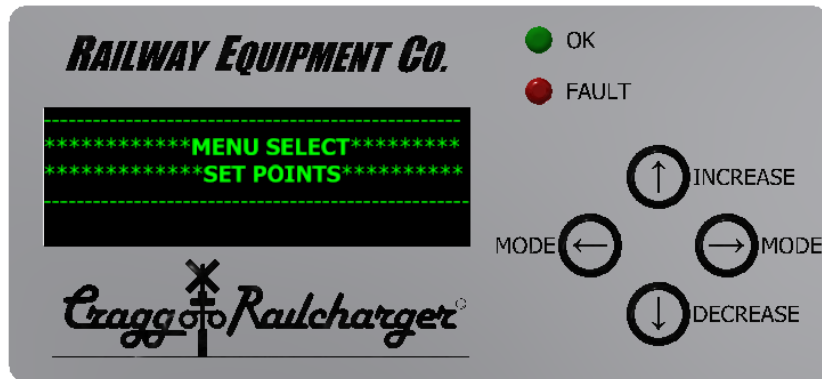
2. Once you powered the charger on, and the OK LED turns green, you will see this start screen:



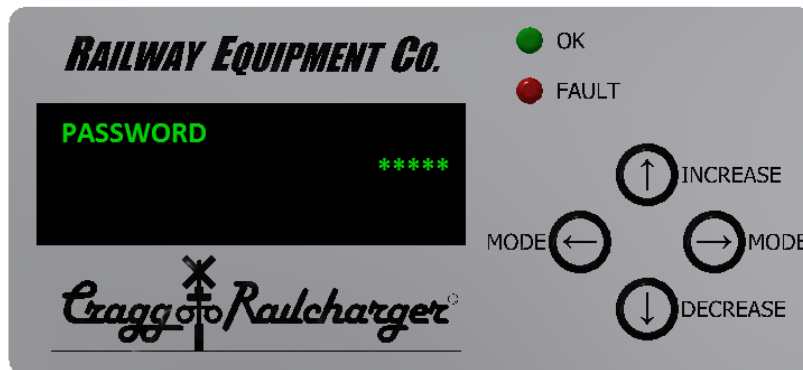
3. Next, you want to go to the **SET POINTS** menu. To do this, click the left mode button once and you will see the following screen:



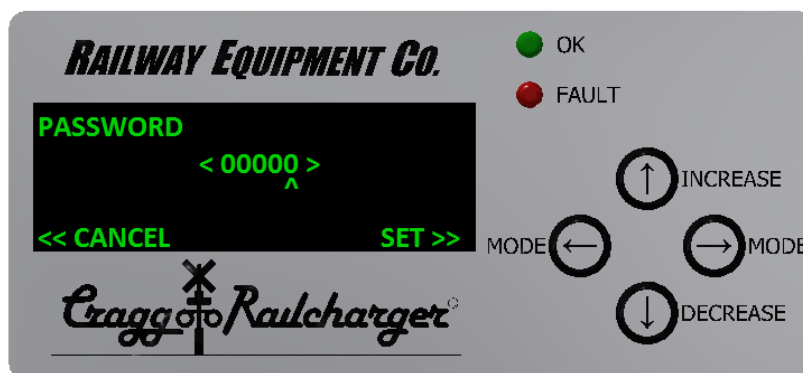
4. Click the increase button twice and you will have reached the **SET POINTS** menu.



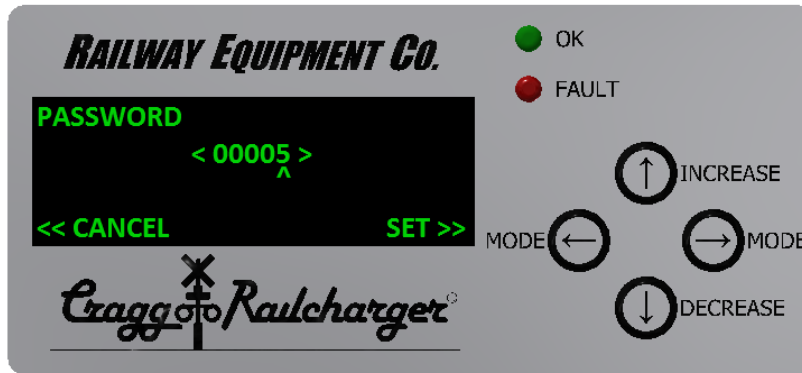
5. Once there, click the right mode button once and you will be at the **PASSWORD** screen.



6. To set a password, first, click the increase button once and you will get the screen below:



7. You can use the increase or decrease buttons to change the values.



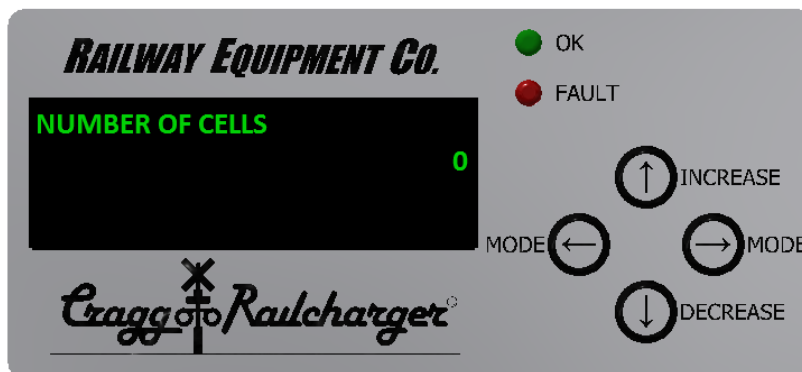
8. You want to have a password of **5** entered in. Once you have entered the 5 in, you need to press and hold the right mode button to set the password. After it is set, it will go back to the original password screen as seen in step 5.

9. After the password, you want to click the right mode button once and you will get to the **USER LEVEL** screen. In this case, just keep it at **BASIC**. Press the right mode button to move on.

10. Now you need to select the **BATTERY TYPE**. Use the increase or decrease buttons to go through the types of battery you could have. Once you find your battery type, push the right mode button once. Here are the different types of batteries:

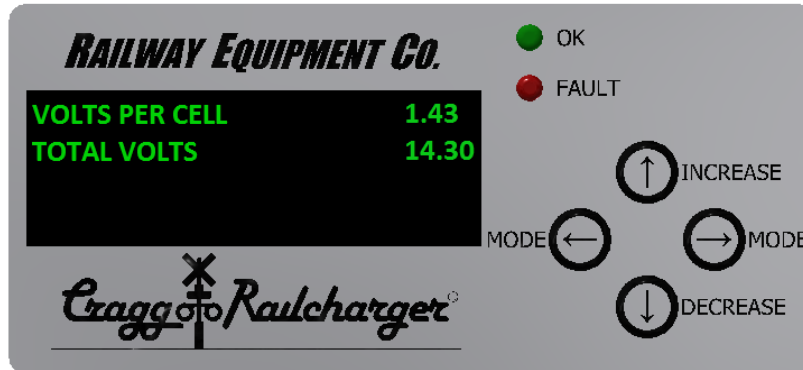
- Generic NI-CAD
- Generic LEAD ACID
- SAFT SPL NI-CAD
- GNB ABSOLYTE

11. Next, you need to set **NUMBER OF CELLS** per your battery bank. At first you will have a value of 0 entered in, use the increase or decrease buttons to change the number of cells you have. Once finished, click the right mode button.



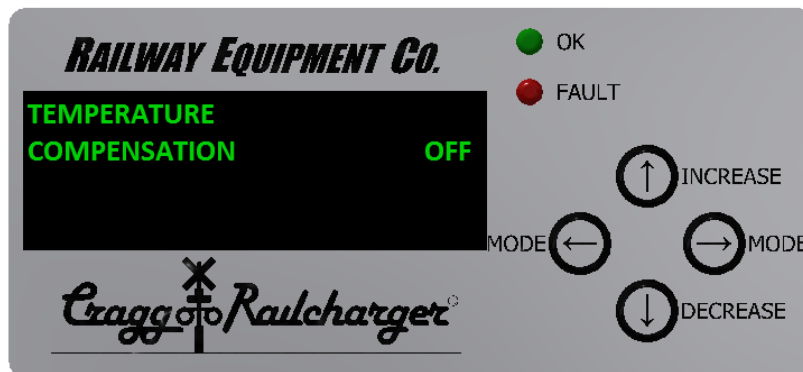
12. Next, you need to set the **VOLTS PER CELL** to the battery manufacturer's specs. Use the increase or decrease buttons to change the volts per cell. You will also notice that the total volts will change with it. After you have your values, click the right mode button.

NOTE: TOTAL VOLTS = NUMBER OF CELLS * VOLTS PER CELL

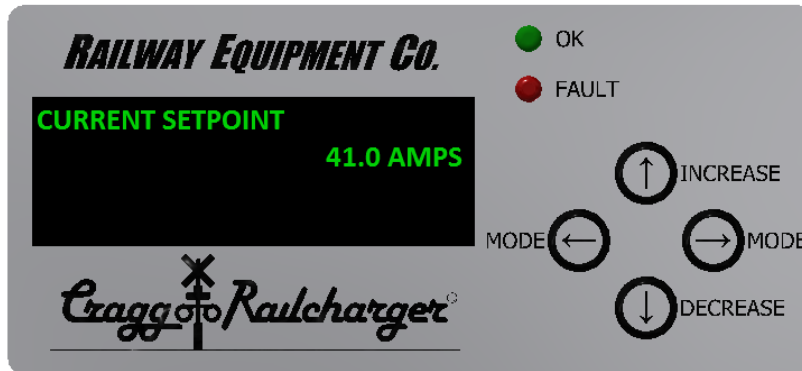


13. Now you will see the **TEMPERATURE COMPENSATION** screen. If you do not have the optional temperature sensor, then you want this to be set at OFF. If you do have the sensor and it is connected, then you have a choice between 50%, 100%, and OFF compensation. Click the right mode button to move on.

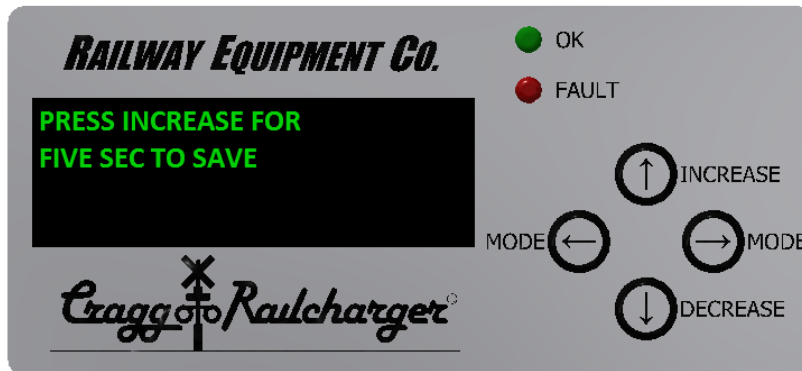
NOTE: If you do not have the optional temperature sensor but set the **TEMPERATURE COMPENSATION** to be either 50% or 100% and save all the values, on the start screen you will see TEMP COMP MISSING and the fault LED light up.



14. Lastly, you will be at your **CURRENT SETPOINT**. Here you use the increase or decrease buttons to set the current setpoint. Once you have your value, click the right mode to finish.



15. Once you have finished entering all values and setpoints, you will see the following screen after the **CURRENT SETPOINT**:



To save your entries, you need to press and hold the increase button for 5 seconds. Once the timer is at zero, the charger will go back to the start screen when you initially power the unit on, and all your values will be saved.

NOTE: Your values will be saved when you shut down the charger and turn it back on.

16. After all the settings have been set, connect your battery bank to one of DC outputs. Have the positive terminal on the battery bank go to a + and the negative terminal go to a – on the DC terminal block.

7 BATTERY CHARGER SET-UP AND ADJUSTMENTS

Controller Menu

The controller has 4 Main Menu Categories:

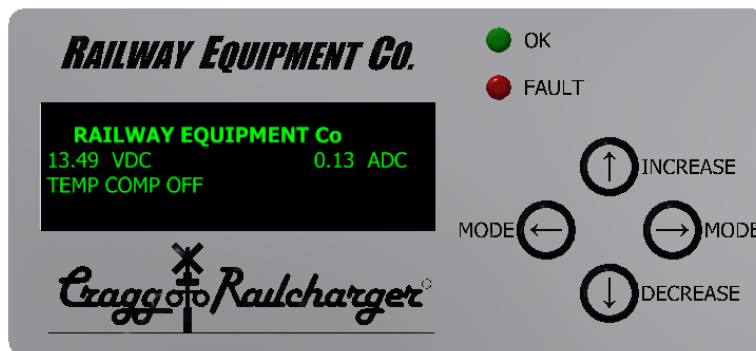
1. STATUS
2. FAULT HISTORY
3. SET POINTS
4. FACTORY DEFAULTS

NOTE: The following menu categories and menu contents are for both password 0 and password 5. They have the same menu categories, but they do not have all the same menu contents. It will be denoted if there is an item only for a certain password (i.e. “password 0 only” or “password 5 only”).

7.1 Status

The STATUS Screen can display BASIC or ADVANCED information based on what the USER LEVEL is set to.

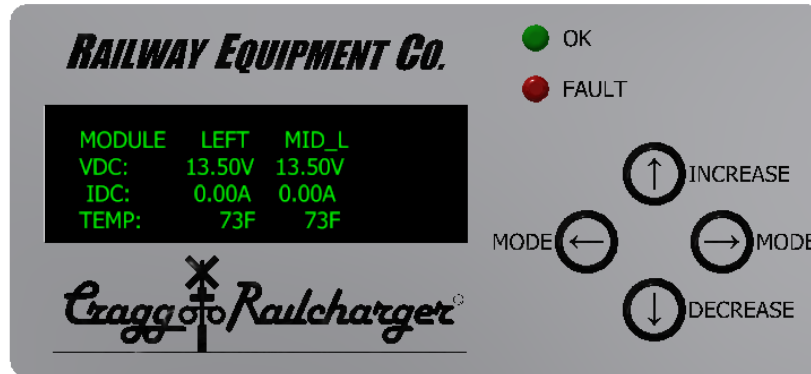
7.1.1 Basic



(Output Voltage) VDC – Displays the voltage being outputted by the charger. This will include battery cells connected to a slave device. The voltage value is measured in VDC. **NOTE:** The value that is shown for the output voltage may differ from your unit.

(Output Current) ADC – Displays the current being outputted by the charger. The current value is measured in ADC. **NOTE:** The value that is shown for the output current may differ from your unit.

TEMP COMP AND BATTERY TEMP – Displays whether or not **TEMPERATURE COMPENSATION** is enabled or disabled and displays the temperature of the batteries if a temperature probe is installed. If there isn't a temperature probe installed, this field will be blank.



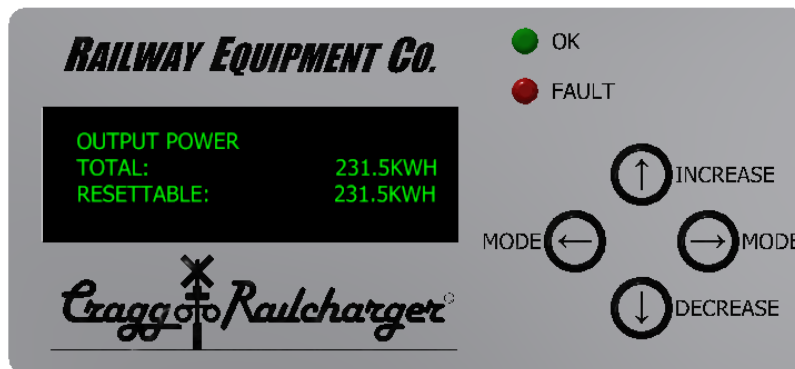
MODULE – Displays the power supply modules you have connected to your SMC. You will see the following:

- VDC: Which you will see the voltage of the individual power supply modules.
- IDC: Which you will see the current of the individual power supply modules.
 - If you add up all of these together, you will match the current setpoint.
- TEMP: Which you will see the temperature of the individual power supply modules.

NOTE: The LEFT is the left-most power supply module in your unit. If you have only two modules, you will see values for LEFT and MID_L. If you have more than two power supplies, press the increase button to display the third and fourth modules. You will then see MID_R and RIGHT with values.

7.1.2 Advanced

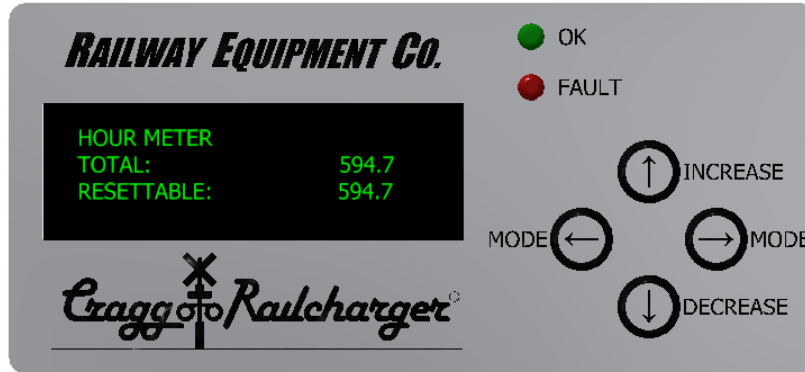
The following are the additional options when settings have been changed from basic to advance.



(Password 5 Only)

TOTAL OUTPUT POWER – Shows the total output power of the battery string. It is measured in kilowatt-hours (KWH).

RESETTABLE TOTAL OUTPUT POWER – This is a resettable display of the total output power. It is measured in kilowatt-hours (KWH).



(Password 5 Only)

TOTAL HOUR METER – This displays the total hours this switch monitor has been operating.

RESETTABLE HOUR METER – This displays the total hours this cell monitor has been operating since this counter has been reset. To reset this counter to zero, press the decrease button.

CONTROL BOARD TEMP – This displays the temperature of the display board.
(Password 5 Only)

7.2 Fault History Menu

NOTE: Some faults may not show in Fault History until there is an actual fault. Press the decrease button to reset the fault count.

OUTPUT RELAY/EQ RELAY – Shows the number of times the battery charger's voltage monitor relay has cycled, and the number of times the battery charger has entered equalization.

POWER UP COUNTER – Shows the number of times the battery charger input power was turned on.

DAYS COUNTER – This shows the total number of days the battery charger has been operating.

TOTAL SECOND COUNTER – Shows the total number of seconds the battery charger has been operating.

HIGH VOLTAGE FAULT COUNTER – Shows the number of times the battery charger voltage's monitor relay has cycled due to a high voltage fault.

LOW VOLTAGE FAULT COUNTER – Shows the number of times the battery charger voltage's monitor relay has cycled due to a low voltage fault.

HIGH CURRENT FAULT COUNTER – Shows the number of times the battery charger voltage's monitor relay has cycled due to a high current fault.

LOW CURRENT FAULT COUNTER – Shows the number of times the battery charger voltage's monitor relay has cycled due to a low current fault.

CHARGER OVER TEMP WARNING COUNTER – Show the number of instances a charger over-temperature warning has occurred.

CHARGER OVER TEMP FAULT COUNTER – Shows the number of times that a charger over-temperature fault has occurred.

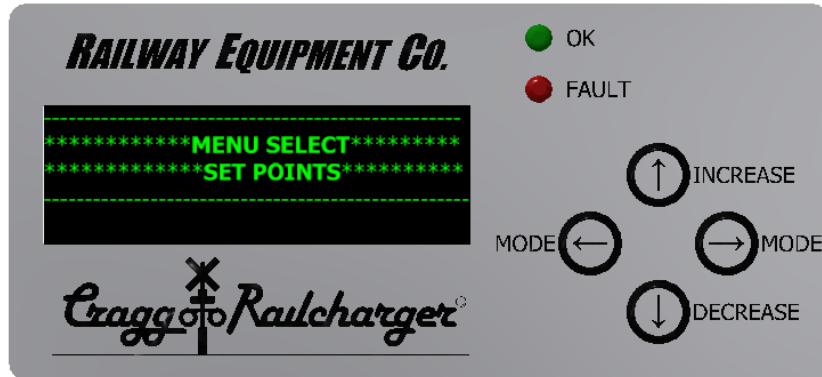
BATTERY OVER TEMP WARNING COUNTER – Show the number of instances a battery over-temperature warning has occurred.

BATTERY OVER TEMP FAULT COUNTER – Shows the number of times that a battery over-temperature fault has occurred.

AC POWER LOST COUNTER – Shows the number of occasions that the AC line voltage was lost (with the charger connected to a battery).

STATUS LOG – This displays the date, time, status, and status channel for the battery charger.

7.3 Setpoints Menu



7.3.1 Basic Setpoints

PASSWORD – To change any user-defined parameter, use the increase button to enter the password of 5. To prevent others from changing parameters, return the password to 0 after making changes.

USER LEVEL

NOTE: Password 0 does not have an advanced level.

The options are **BASIC** and **ADVANCED**.

- **BASIC** – Access to the basic menu options
- **ADVANCED** – Access to the advanced menu options

BATTERY TYPE – The options are **GENERIC LEAD ACID**, **GENERIC NI-CAD**.

- **GENERIC LEAD ACID** – The type of battery being used is Lead Acid.
- **GENERIC NI-CAD** – The type of battery being used is Ni-Cad.

NOTE: Also included are presets for several specific brands such as **GNB Absolyte** and **SAFT SPL NI-CAD**.

NUMBER OF CELLS –

- **NI-CAD:** 5-12 cells are useable.
- **LEAD ACID:** 5-8 cells are useable.

VOLTS PER CELL/TOTAL VOLTS –

- **NI-CAD** – The values range from **1.2-1.6VDC**
- **LEAD ACID** – The values range from **2-2.45VDC**.
- For **GNB Absolyte** and **SAFT SPL NI-CAD** this value is fixed base on the manufacturers' spec.
- **TOTAL VOLTS** is a calculation of **NUMBER OF CELLS x VOLTS PER CELL**.

TEMPERATURE COMPENSATION – When the temperature sensor is connected, the battery charger will adjust the output voltage up or down depending on the temperature of the batteries. Selecting a brand of battery (GNB, SAFT, etc.) from the “**BATTERY TYPE**” menu may enable this feature if that is the manufacturer’s suggested use. See the table below for Temperature Compensation rates. By default this is disabled.

Table 5: Temperature Compensation Rates

Battery Type	Compensation Mode	Compensation Slope	Low Temp Limit	High Temp Limit
Lead Acid	50% V/T	1.47mV/°F/cell	2.35 volts/cell@ +3°F	2.20 volts/cell@ +116°F
Lead Acid	100% V/T	3.0mV/°F/cell	2.35 volts/cell@ +37°F	2.20 volts/cell@ +95°F
Ni-Cad	50% V/T	0.967mV/°F/cell	No Limit	No Limit
Ni-Cad	100% V/T	1.94mV/°F/cell	No Limit	No Limit

CURRENT SET POINT – This setting is used to adjust the maximum output current limit.

HIGH VOLTAGE FAULT – This adjustment is for setting the voltage level when the voltage monitor relay toggles for an overvoltage fault.

STATUS RELAY LOW VOLTAGE SETPOINT – This is used to set the voltage below which the voltage monitor relay changes state. As an example, it could be set for 10% below the normal battery output voltage, to trigger an alert before the voltage dropped to a point where it would no longer operate the equipment it was attached to.

POWER RELAY LOW VOLTAGE SETPOINT – This is used to set the voltage below which the voltage monitor relay changes state. As an example, it could be set for 10% below the normal battery output voltage, to trigger an alert before the voltage dropped to a point where it would no longer operate the equipment it was attached to.

MY IP ADDRESS – Shows the charger’s IP address (DHCP is disabled by default).

NOTE: Default IP Address is 192.168.4.99:50000

7.3.2 Advanced Setpoints

The following are the additional options when settings have been changed from basic to advance.

NOTE: All of the following setpoints are for when a password of 5 is entered in and when the user level is changed to advanced.

HIGH CURRENT FAULT – The parameter is the high amperage setting. The voltage monitor relay will toggle if the current is higher than the selected current.

LOW CURRENT FAULT – The voltage monitor relay will toggle if the current is lower than the selected current. This should be set lower than the expected lowest current output, as when the batteries are fully charged and no equipment is running.

HIGH BATTERY TEMP – This setting allows the user to set the temperature that will trigger a high battery temperature fault. If a high battery temperature fault occurs, the voltage monitor relay will toggle. The factory default value is 160°F.

LOW BATTERY TEMP – This setting allows the user to set the temperature that will trigger a low battery temperature fault. If a low battery temperature fault occurs, the voltage monitor relay will toggle. The factory default value is -40°F.

SELECT F OR C – This is used to choose the temperature units of measure. The choices are F for Fahrenheit and C for Celsius. The factory default is F.

EQUALIZATION – This is used to enable or disable the equalization charge function.

CELL MONITOR – By default, it is NOT INSTALLED. When you have an optional cell monitor, select this as installed and connect the cell monitor to the charger using an ethernet cable to the RS485 ports. The use of a cell monitor is to have the charger monitor the voltage of the individual battery cells in the string.

SWITCH MONITOR – By default is NOT INSTALLED. When installed, you can connect switch machines (current coil or current shunts) to the charger and monitor switch movements.

BATTERY METER– By default, it is NOT INSTALLED. Once you change it to being INSTALLED, this setting enables the Battery Meter functionality.

BATTERY TESTING – This is used to test the string of batteries connected to the SMC charger when enabled. By default it is disabled.

LOAD BANK – This setting is used when installing a load bank to work with an SMC charger. By default, this is not installed.

GROUND FAULT TEST – This is either enabled or disabled. When enabled, the Ground Fault Test is used to detect if the batteries are connected to ground. By default, this is disabled.

REMOTE COMPENSATION – This enables or disables the battery charger’s remote sensing.

MODULE TEMP BALANCE – This setting is used to adjust the output power of the power supply modules to maintain the same temperature.

LOW POWER OPTIMIZE – This enables or disables the battery charger’s low power optimize feature.

STATUS RELAY AC LOST FAULT – When AC power is lost the Voltage Monitor Relay will open. The factory default is ENABLED.

POWER RELAY AC LOST RELAY – When AC power is lost the Voltage Monitor Relay will open. The factory default is ENABLED.

TIME ZONE – This is used to set the time zone in the battery charger

DATE AND TIME – This sets the date and time in the battery charger.

SET DISPLAY NAME – This can be used to set a display name in the charger.

PROG REV & DATE – This displays the firmware revision level and the date that revision was released.

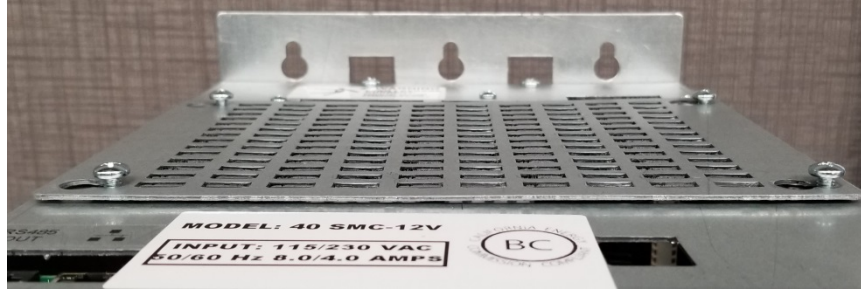
7.4 Factory Defaults

FOR FACTORY DEFAULTS PRESS DECREASE – This is to allow the user to return most settings to the original factory settings by pressing the decrease button.

8 REPLACING A POWER SUPPLY MODULE

To replace a power supply module in an SMC Battery Charger, follow the steps below:

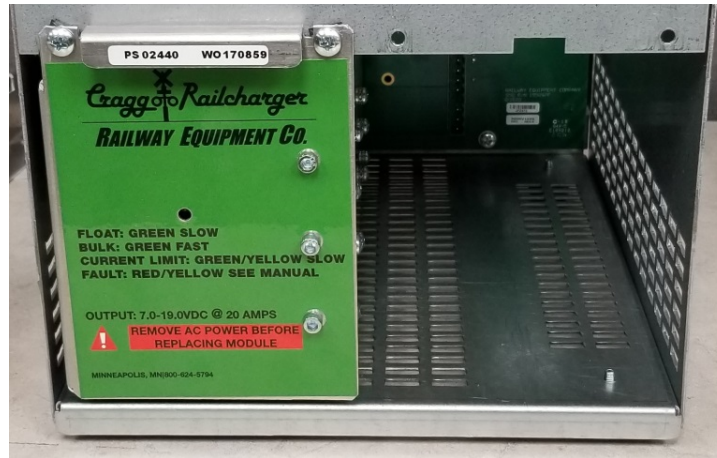
1. Before performing maintenance, disconnect AC power from the charger and wait for all lights to turn off.
2. Prepare top cover for removal by slightly loosening the 4 screws holding it in place.



3. Slide the top cover to the larger area in the keyhole and lift it off of the charger.
4. Locate the power supply module that you wish to replace.
5. Remove the 2 screws securing the module to the charger and set them aside.



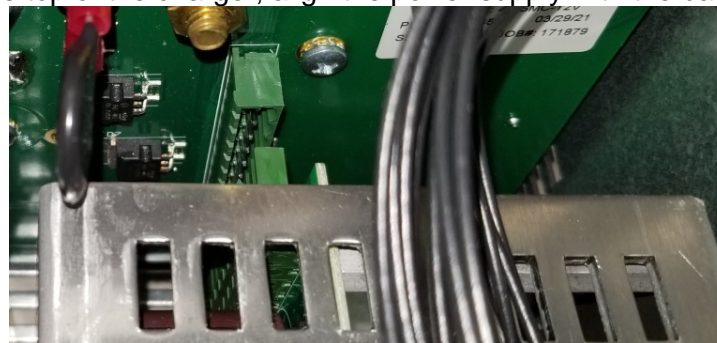
6. Grasp the lip of the power supply and carefully pull towards you.
NOTE: You may need to wiggle the power supply up and down to release it from the backplane connector.



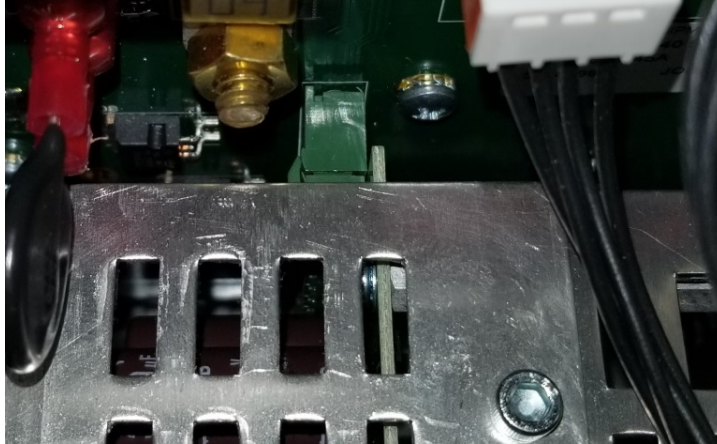
7. Take the new power supply and slide it into the slot. Do not seat the connector.



8. Looking from the top of the charger, align the power supply with the backplane connector.



9. Once aligned, push together. The power supply will stop when it is fully seated.



10. Reinstall the 2 mounting screws in the top of the power supply module and tighten.
11. Replace the top cover on the charger and slide into place.
12. Tighten the 4 screws to secure the cover.
13. Connect AC power back to the charger.

9 SPECIFICATIONS

Table 6: General Specifications

Description	Specification	
Input Voltage	115-230VAC ± 15%, 50, 60 Hz	
Voltage Regulation	± 1%	
Voltage Ripple	< 100mV volt ripple, peak to peak at maximum output current	
Operating Temperature (0-95% non-condensing humidity)	-40°F to +158°F	-40°C to +70°C

Table 7: Model Specifications

Model No.	Cells	115VAC Amps	230VAC Amps	Output Amps	Output Volts	Width x Height x Depth	Ship Weight
20SMC-12V	5–8 Lead Acid 5–12 NiCad	5.0 Amps	2.5 Amps	20.0 Amps	7.0 to 18.8 Volts	9 x 11 x 10.50 inches	12 lbs.
20SMC-24V	11–18 Lead Acid 18–26 NiCad	10 Amps	5.0 Amps	20.0 Amps	24.0 to 40.0 Volts	9 x 11 x 10.50 inches	20 lbs.
40SMC-12V	5–8 Lead Acid 5–12 NiCad	10.0 Amps	5.0 Amps	40.0 Amps	7.0 to 18.8 Volts	9 x 11 x 10.50 inches	20 lbs.
40SMC-24V	11–18 Lead Acid 18–26 NiCad	20 Amps	10 Amps	40.0 Amps	24.0 to 40.0 Volts	17.50 x 10.875 x 10.50 inches	35 lbs.
60SMC-12V	5–8 Lead Acid 5–12 NiCad	15 Amps	7.5 Amps	60.0 Amps	7.0 to 18.8 Volts	17.50 x 10.875 x 10.50 inches	30 lbs.
80SMC-12V	5–8 Lead Acid 5–12 NiCad	20 Amps	10 Amps	80.0 Amps	7.0 to 18.8 Volts	17.50 x 10.875 x 10.50 inches	35 lbs.