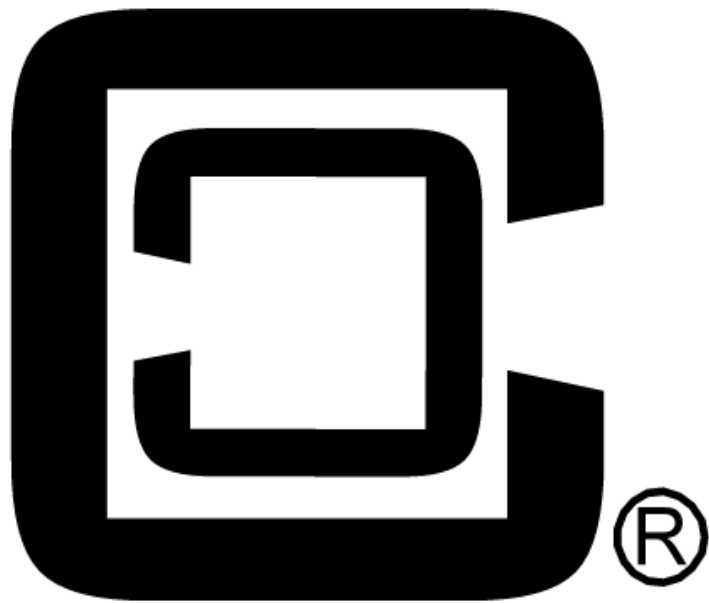


CLIPPERCREEK, INC.
INNOVATIVE INFRASTRUCTURE FOR
ELECTRIC AND HYBRID VEHICLES



User's Manual



Model ECS

PLEASE NOTE

This user's manual includes the latest information at the time of printing. ClipperCreek, Inc. reserves the right to make changes to this product without further notice. Changes or modifications to this product by other than an authorized service facility could void the product warranty.

If you have questions about the use of this product, contact your customer service representative. Refer to the Customer Support section located in this guide.

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IMPORTANT SAFETY INSTRUCTIONS

Carefully read these instructions and the charging instructions in your vehicle owner's handbook before charging your electric vehicle.

The following symbols may be found in your handbook or on labels affixed to your conductive charge station:

Note *This means pay particular attention.* Notes contain helpful suggestions.



Caution *This symbol means be careful.* You are capable of doing something that might result in damage to equipment.



Warning *This symbol means danger.* You are in a situation that could cause bodily injury. Before you work on any electrical equipment, be aware of the hazards involved with electrical circuitry and standard practices for preventing accidents.

Instructions Pertaining to a Risk of Fire or Electric Shock

When using the the ECS, the following basic electrical safety precautions should be followed:

- Use this charge station to charge electric vehicles equipped with an *SAE-J1772^m charge port only*. See the vehicle's owner's handbook to determine if the vehicle is equipped with the correct charge port.
- Make certain the charge station's SAE-J1772TM charge cable is positioned so it will not be stepped on, tripped over, or otherwise subjected to damage or stress.
- There are no user serviceable parts inside. Refer to the Customer Support section in this manual for service information. Do not attempt to repair or service the charge station yourself.
- Do not operate your charge station if it or the SAE-J1772TM charge cable is physically open, cracked, frayed, or otherwise visibly damaged. Contact your Service Representative for service immediately. Refer to the Customer Support section in this manual for information on the Service Representative in your area.
- Do not place fingers inside of the coupler end of the SAE-J1772TM charge cable.
- Do not allow children to operate ths device. Adult supervision is mandatory when children are in proximity to a charge station that is in use.



Save these instructions for future reference.

SAFETY INFORMATION



Warning: Unplug the ECS before cleaning the unit.

Note VENTILATION: Some electric vehicles require an external ventilation system to prevent the accumulation of hazardous or explosive gases when charging indoors. Check the vehicle's owner's handbook to determine if your vehicle requires ventilation during indoor charging.

Note Those vehicles which follow the SAE-J1772™ standard for communication with the charging station can inform the ECS that they require an exhaust fan. The ECS is not equipped to control ventilation fans. Do not charge your vehicle with the ECS if ventilation is required by your vehicle.



Caution: DO NOT charge your vehicle indoors if it requires ventilation. Contact your Service Representative for information.

FCC INFORMATION

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.

This product has been designed to protect against Radio Frequency Interference (RFI). However there are some instances where high powered radio signals or nearby RF-producing equipment (such as digital phones, RF communications equipment, etc.) could affect operation.

If interference to your charge station is suspected, we suggest the following steps be taken before consulting your ClipperCreek Sales and Service Representative for assistance:

1. Reorient or relocate nearby electrical appliances or equipment during charging.
2. Turn off nearby electrical appliances or equipment during charging.



Caution Changes or modifications to this product by other than an authorized service facility may void FCC compliance.

OPERATION

The ECS is a Portable Charging Station that provides the Plug-in Hybrid or Battery Electric Vehicle (together Plug-In Electric Vehicles or PEV) user with a safe and manageable link between the power grid and the PEV.

Figure 1. The ECS with Ground Monitor Front Panel

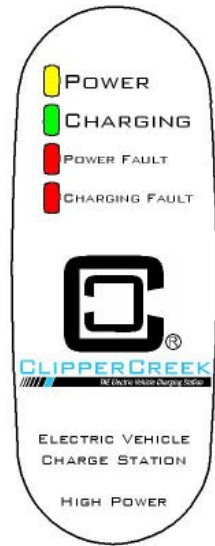
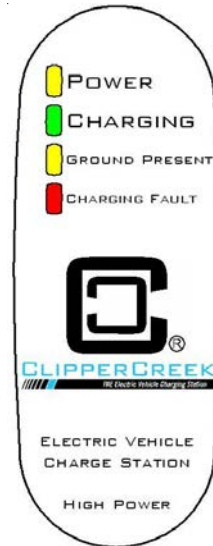


Figure 2. The ECS with Isolation Monitor Front Panel



The ECS is very easy to use. Just unwrap the charging cable, insert the service power plug into any 230V wall socket, and plug the vehicle connector firmly into the vehicle's charge port. Always plug the ECS into the wall socket prior to connecting to the vehicle.

Normally, the vehicle will immediately request a charge using a special communication line in the cable and within a few seconds the green Charging light will come on and charging will begin. After an average driving day, it will require several hours to recharge completely. Charging overnight is the most convenient way to maintain healthy batteries and ensure the vehicle's full range will be available for the next day.

When disconnecting the ECS, always remove the vehicle connector first, then remove the service power plug from the wall socket. When not in use, the cord may be rewrapped around the ECS and the entire assembly secured with the nylon buckle strap.

If charging always takes place in the same location, such as the home garage at night, the ECS may be left plugged into the wall socket without damage.

FRONT PANEL - Ground (Earth) Monitor

The front panel on the ECS has 4 indicator lights with a distinct label for each.

An ECS may be configured from the factory with either a ground (earth) monitor circuit or an isolation (insulation) monitor circuit. Refer to the front panel overlay or serial number label to distinguish which circuit the ECS is configured with.

The front panel description on this page applies to an ECS configured with a ground (earth) monitor, as indicated by the presence of a red "Power Fault" indicator light.

Power (amber), indicates that power is available.

Charging (green), indicates power has been applied to the vehicle.

Power Fault (red), indicates that the wall socket is not wired correctly. The problem can be a wall socket that has no ground (protective earth) connection. The wall socket wiring should be examined by a qualified electrician.

Charging Fault (red), indicates that the ECS is unable to communicate with the vehicle correctly.

Table 1. Front panel LED information for a ground monitor-equipped ECS

#	Amber Power LED	Green Charging LED	Red Power Fault LED	Red Charging Fault LED	Fault Condition
1	off	off	off	off	No power to EVSE. Check circuit breaker.
2	ON	off	off	off	Not plugged into the EV or the EV is not ready to charge.
3	ON	ON	off	off	Charging enabled, power is applied to the vehicle
4	ON	off	ON – not blinking	off	* Improper grounding or ground is not present.
5	ON	off	off	ON – not blinking	* Problem with EV communications. Disconnect and restart.
6	ON	off	off	blinking	* EV ground fault trip. Check vehicle connection.
7	ON	off	blinking	blinking	* Internal EVSE fault. Call for service.

* ECS will automatically restart after 15 seconds

FRONT PANEL - Isolation (Insulation) Monitor

The front panel on the ECS has 4 indicator lights with a distinct label for each.

An ECS may be configured from the factory with either a ground (earth) monitor circuit or an isolation (insulation) monitor circuit. Refer to the front panel overlay or serial number label to distinguish which circuit the ECS is configured with.

The front panel description on this page applies to an ECS configured with an isolation monitor, as indicated by the presence of an amber "Ground Present" indicator light.

Power (amber), indicates that power is available.

Charging (green), indicates power has been applied to the vehicle.

Ground (Earth) Present (amber), indicates the status of the ECS isolation monitor. Should there be less than approximately 50KOhms of measured resistance to ground (earth), the LED turns on. When the resistance to ground (earth) exceeds 50KOhms, this LED turns off. The ECS will charge the vehicle in either condition.

Charging Fault (red), indicates that the ECS is unable to communicate with the vehicle correctly.

Table 2. Front panel LED information for an isolation monitor-equipped ECS

#	Amber Power LED	Green Charging LED	Amber Ground Present LED	Red Charging Fault LED	Fault Condition
1	off	off	off	off	No power to EVSE. Check circuit breaker.
2	ON	off	ON or off	off	Not plugged into the EV or the EV is not ready to charge.
3	ON	ON	ON or off	off	Charging enabled, power is applied to the vehicle
4	ON	ON or off	ON – not blinking	off	Isolation monitor detects low resistance to ground
5	ON	ON or off	off	off	Isolation monitor detects high resistance to ground
6	ON	off	ON or off	ON – not blinking	* Problem with EV communications. Disconnect and restart.
7	ON	off	ON or off	blinking	* EV ground fault trip. Check vehicle connection.
8	ON	off	blinking	blinking	* Internal EVSE fault. Call for service.

* ECS will automatically restart after 15 seconds

SPECIFICATIONS

Input Power

Voltage & Wiring	230V AC
Voltage Range:	185V AC to 264V AC
Frequency	50Hz

Current	<u>ECS Model</u>	<u>Maximum Current</u>
	ECS-15	10A or 12A
	ECS-16	13A
	ECS-20	15A or 16A

Note that the maximum current for the vehicle is set by the duty cycle of the Pilot waveform. Refer to the ECS serial number label for the specific factory-set maximum current rating.

Output Power

Variable depending upon the ECS model and vehicle demand. At 230V AC, the ECS-15 outputs approximately 2.3KW (10A) or 2.7KW (12A), the ECS-16 3.0KW, and the ECS-20 3.5KW (15A) or 3.7KW (16A).

Dimensions

Height	280 mm (11 in)
Width	100 mm (4 in)
Depth	80 mm (3 in)

Weight

3 kg (7 lbs) with SAE-J1772™ connector and 4.6m (15') of cable

Environment

Operating Temperature	-30°C (-22°F) to +50°C (+122°F)
Enclosure Rating	NEMA 4X - watertight

Agency Approvals

NRTL Listed, FCC Part 15 Class B

MAINTENANCE

The ECS requires no maintenance other than occasional cleaning.



Warning To reduce the risk of electrical shock or equipment damage, be cautious while cleaning the connectors and case.

Clean the ECS using a soft cloth lightly moistened with mild detergent solution. Never use any type of abrasive pad, scouring powder, or flammable solvents such as alcohol or benzene.

CUSTOMER SUPPORT

Call your ClipperCreek, Inc. Service Representative at any time, 24 hours a day, at the number below. If your call is made after business hours or on weekends, please leave your name, telephone number, and a brief description of the problem. A Field Service Representative will call back at the earliest opportunity.

**Distributor Service
Number Here**

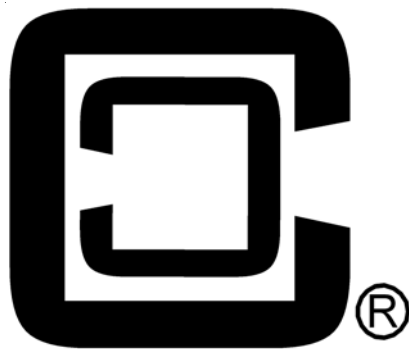
WARRANTY INFORMATION

ClipperCreek, Inc. warrants this product to be free from defects in material, manufacture and design for a period of one year after the date of purchase. If this product is defective in materials, manufacture or design during this warranty period, ClipperCreek, Inc. will, at its option, repair or replace the product. Repair parts and /or replacement products may be either new or reconditioned at ClipperCreek's discretion. This limited warranty does not include service to repair damage from improper installation, improper connections with peripherals, external electrical fault, accident, disaster, misuse, abuse or modifications to the product not approved in writing by ClipperCreek, Inc. Any service repair outside the scope of this limited warranty shall be at applicable rates and terms then in effect.

All other express and implied warranties for this product including the warranties of merchantability and fitness for a particular purpose, are hereby disclaimed. Some states do not allow the exclusion of implied warranties or limitations on how long an implied warranty lasts, so the above limitation may not apply to you.

If this product is not as warranted above, your sole and exclusive remedy shall be repair or replacement as provided above. In no event will ClipperCreek, Inc., any of its authorized sales and service representatives, or its parent company be liable to the customer or any third party for any damages in excess of the purchase price of the product. This limitation applies to damages of any kind including any direct or indirect damages, lost profits, lost saving or other special, incidental, exemplary or consequential damages whether for breach of contract, tort or otherwise or whether arising out of the use of or inability to use the product, even if ClipperCreek, Inc. or an authorized ClipperCreek, Inc. representative or dealer has been advised of the possibility of such damages or of any claim by any other party. Some states do not allow the exclusion or limitation of incidental damages for some products, so the above limitation or exclusion may not apply to you.

This warranty gives you specific legal rights, and you may also have other rights which may vary from state to state.



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