

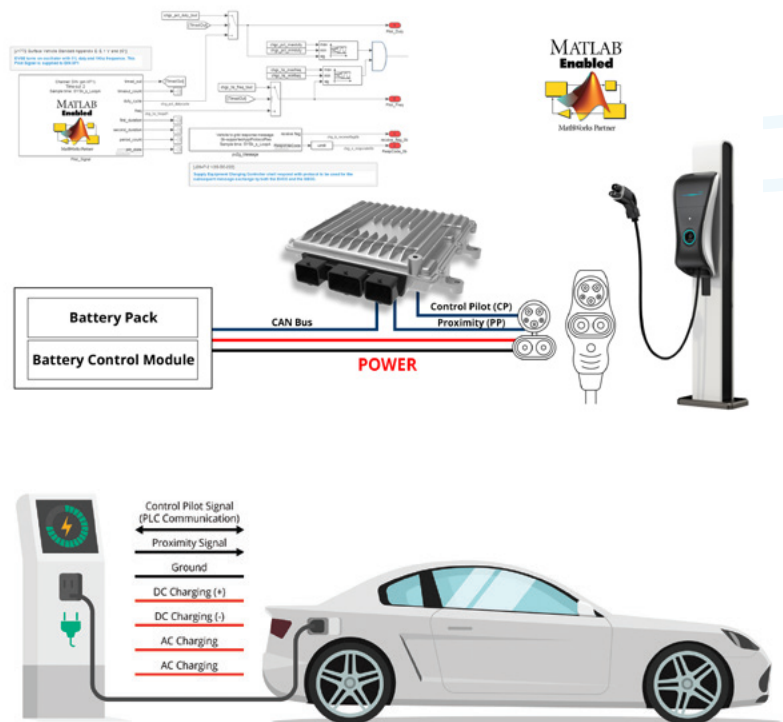


CCS Control Strategies OpenECU™ Application Software

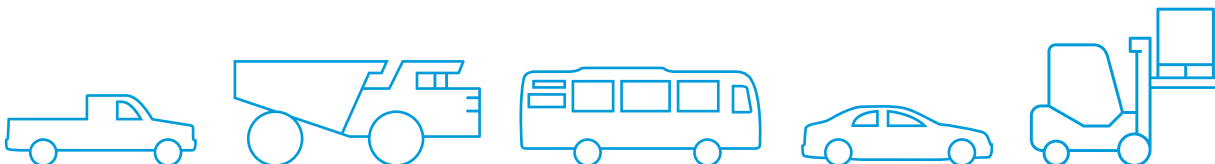
Combined Charging System Control Strategies

Summary

Dana is now offering a software application source code product that implements Combined Charging System (CCS) control with the M560 and M580 that can be used in conjunction with the already powerful supervisory control capabilities of those controllers. M560 and M580 are designed to support AC charging (hardware) and DC charging (hardware and software) sessions in accordance with SAE J1772, IEC 61851, DIN 70121, ISO 15118 charging standards.



Ideal for light, commercial and off-highway vehicles.



Combined Charging System Control Strategies

OpenECU™ Application Software

The M560 and M580 hardware is equipped with a modem chip (Qualcomm Powerline Communication (PLC) chipset) enabling digital communication between Electric Vehicle Service Equipment (EVSE), and the Electric Vehicle (EV). M560 or M580 hardware supports control and communication signals used in various physical charging interfaces; Type 1 (AC, DC and Combined Charging), and Type 2 (AC, DC and Combined Charging).

The OpenECU application software from Dana supports SAE J2847-2 and DIN 70121 implementing Vehicle to Grid (V2G) communication between EVSE and the EV. A Simulink API is available to provide an interface to the OpenECU hardware, and allow the development of CCS control software.

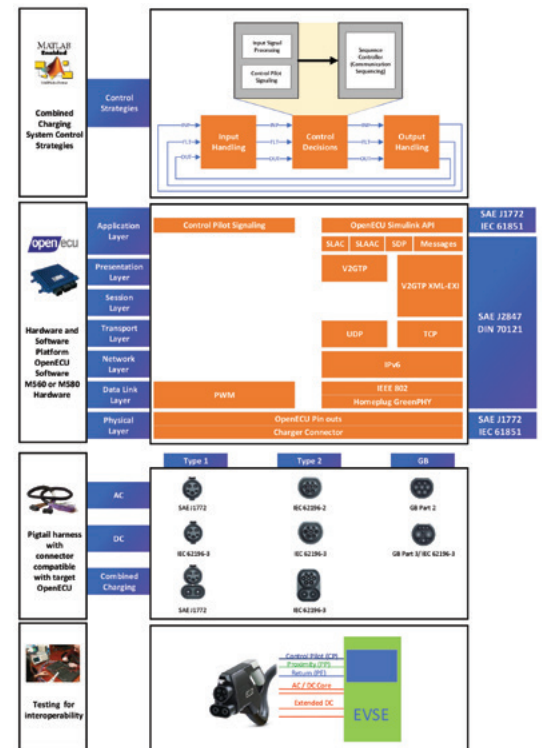
The application of CCS can be realized using Dana's CCS model-based Control Strategies, and functionalities include Input Signal Processing, Control Pilot Signaling, and Sequence Controller (Communication Sequencing).

The following table shows the standards and types of charging supported by M560 or M580 with CCS :

PRODUCT	STANDARDS				
	SAE J1772	IEC 61851	SAE J2847	DIN 70121	ISO 15118
HARDWARE	✓	✓	✓	✓	✓
OpenECU SOFTWARE	✓	✓	✓	✓	✓
CCS CONTROL STRATEGIES	✓	✓	✓	✓	✓

PRODUCT	CHARGING TYPE			
	AC SINGLE PHASE	AC THREE PHASE	DC CORE	DC EXTENDED
HARDWARE	✓	✓	✓	✓
OpenECU SOFTWARE	✓*	✓*	✓	✓
CCS CONTROL STRATEGIES	✓*	✓*	✓	✓

*Note: AC Charging requires basic signaling and is implemented on Hardware. Not required in software or control strategy.



OpenECU.com

Application Policy

Capacity ratings, features, and specifications vary depending upon the model and type of service. Application approvals must be obtained from Dana; contact your representative for application approval. We reserve the right to change or modify our product specifications, configurations, or dimensions at any time without notice.

Dana Plymouth Technology Center

47047 West Five Mile Road
 Plymouth, MI 48170
 Tel: +1 (734) 656 0140 Fax: +1 (734) 656-0141
 OpenECU.com

